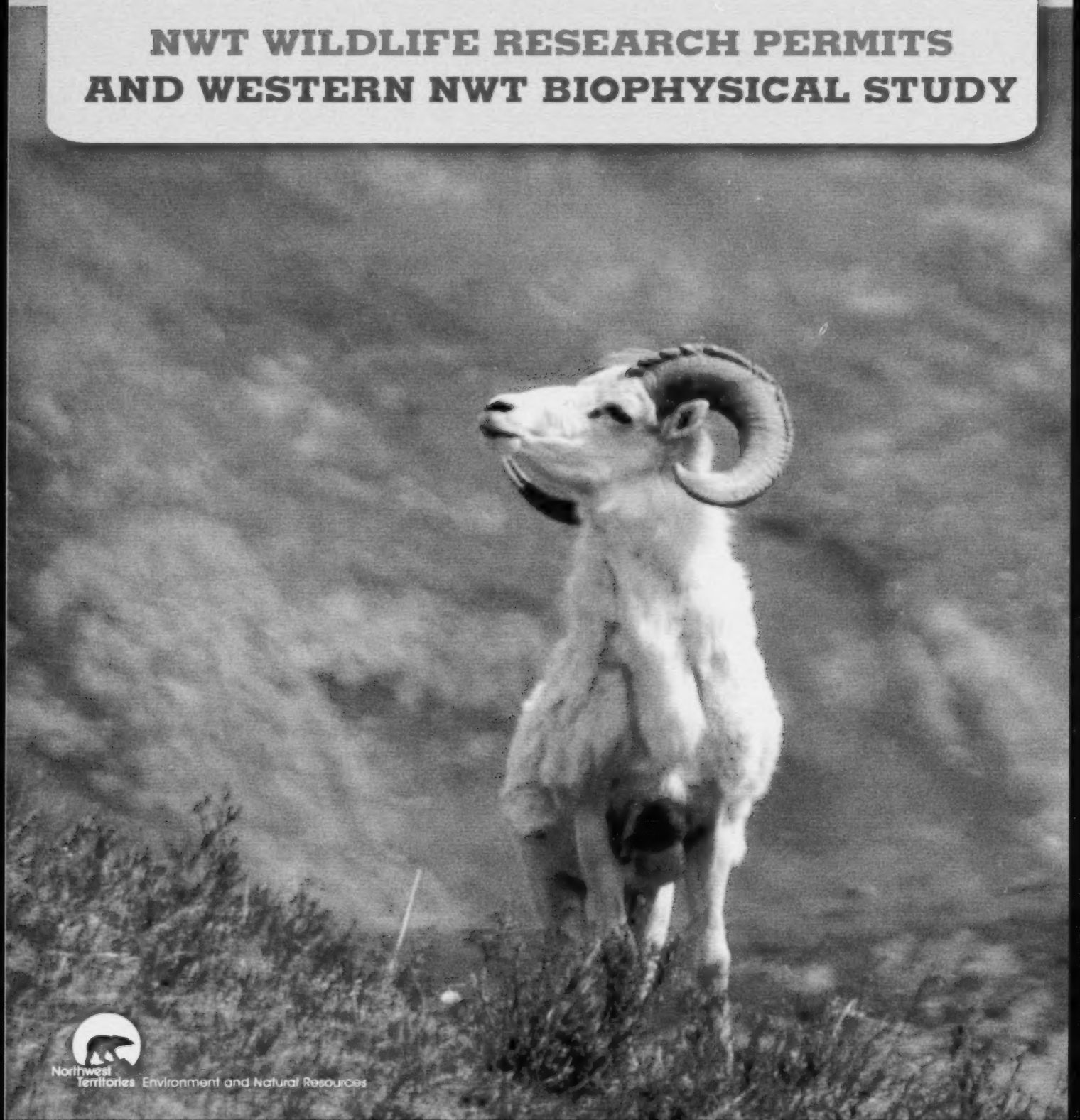
2010
ANNUAL REPORT OF

NWT WILDLIFE RESEARCH PERMITS AND WESTERN NWT BIOPHYSICAL STUDY



Northwest Territories Environment and Natural Resources

Cover Photo: Boyan Tracz

2010 ANNUAL REPORT of
NWT WILDLIFE RESEARCH PERMITS

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Northwest Territories Centre for Geomatic

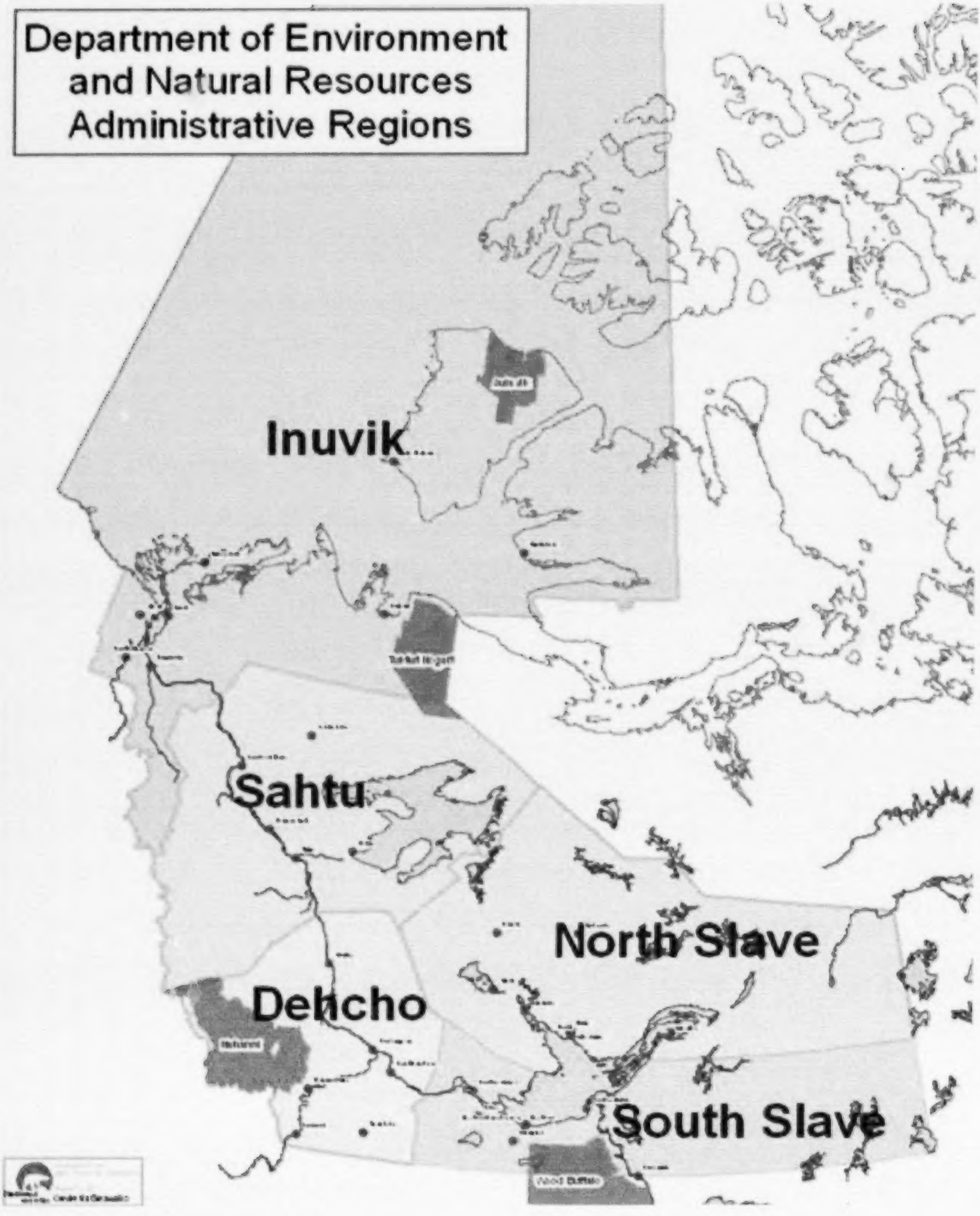
Department of Environment
and Natural Resources
Administrative Regions
Inuvik
Sahtu
North Slave
Dehcho
South Slave

Photo: S. Topp

2010

Annual Report of NWT Wildlife Research Permits

Under the *Wildlife Act* (section 24), a valid Wildlife Research Permit is required to study wildlife or wildlife habitat in the Northwest Territories (NWT). It is an offence to conduct a survey or census of wildlife or wildlife behaviour, administer drugs, collect or purchase specimens, or carry out any scientific research relating to wildlife without a permit.

The Department of Environment and Natural Resources (ENR) is responsible for issuing Wildlife Research Permits. Each year, researchers carry out studies on all types of wildlife and wildlife habitat, throughout the NWT. As a requirement of an NWT Wildlife Research Permit, researchers must submit a summary report of their activities and findings to ENR. These summary reports are published each year in an annual report.

This publication provides summary reports for the wildlife research carried out during 2010. Contact information for the main investigator leading each project has been included if you wish to obtain more information on a specific project. For more information on Wildlife Research Permits, please go to www.enr.gov.nt.ca or contact your local Environment and Natural Resources office.

The contents of each summary are the sole responsibility of the team leads for each project and do not reflect any official policy of ENR or the Government of the Northwest Territories (GNWT).

Assessment of Possible Impacts of Oil and Gas Activities on Polar Bears in the Outer Mackenzie Delta and Nearshore Southern Beaufort Sea

Period: March 15, 2010 to September 15, 2010

Main Investigator: Evan Richardson, Wildlife Biologist, Environment Canada

Wildlife Research Permit Number: WL007409

LOCATION:

Coastal surveys for polar bear dens were conducted from March 16, 2010 to March 31, 2010 between Herschel Island and Cape Dalhousie on the Tuktoyaktuk Peninsula.

RATIONALE:

This project was initiated in response to concerns regarding the potential impacts of onshore oil and gas development on denning female polar bears in the southern Beaufort Sea.

OBJECTIVES:

To collect information on the distribution and level of polar bear denning activity in the southern Beaufort Sea; and

To identify and protect potential polar bear maternity denning habitat using a landscape level denning habitat model and traditional ecological knowledge.

METHODS:

In order to identify and protect polar bear maternity denning habitat, both the location and the habitat requirements of denning female bears needed to be assessed. Den locations in the study area were located using three different sources of data: (1) aerial surveys conducted in the spring of each year when females and cubs are emerging from and leaving their dens, (2) through personal interviews with Inuvialuit hunters directed at acquiring traditional ecological knowledge on past den locations and sightings of adult females accompanied by newborn young early in spring, and (3) through the use of satellite collar data from Canadian and Alaskan research programs. Den site habitat characteristics were assessed in the summer by visiting known den sites that were located during spring aerial surveys.

RESULTS AND MAIN CONCLUSIONS:

During our aerial surveys in the spring of 2010 we did not locate any new polar bear maternity den sites in the Inuvialuit Settlement Region. Previously located den sites have been used to create a landscape level model that identifies the distribution of suitable polar bear maternity denning habitat in the Mackenzie Delta. A final report on this study will be produced in December 2011.

LONG-TERM PLANS AND RECOMMENDATIONS:

This project is scheduled for completion in December of 2011. Results from this study will be used in the development of a range-wide management plan for polar bears in the southern Beaufort Sea to help mitigate the potential effects of oil and gas development on polar bears in the western Arctic.

PARTNERS:

Environment Canada
Environment and Natural Resources (GNWT)
Yukon Department of Environment
Inuvialuit Game Council
Polar Continental Shelf Project
United State Geological Survey

COMMUNITY INVOLVEMENT:

As part of this study we conducted polar bear traditional knowledge (TK) interviews in the communities of Inuvik, Aklavik and Tuktoyaktuk (n=46) to help collect local knowledge on the location of historical polar bear dens across the Inuvialuit Settlement Region. In addition to our TK work, local observers were hired to participate in our aerial surveys for polar bear den sites.

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Photo: E. Richardson

Populations and Sources of Recruitment in Polar Bears

Period: April 18, 2010 to June 30, 2010

Main Investigator: Andrew E. Derocher, Professor, University of Alberta

Wildlife Research Permit Number: WL007376

Photo: A.E. Derocher

LOCATION:

The study was based from Tuktoyaktuk, on the sea ice directly north of Tuktoyaktuk eastward to the end of the Tuktoyaktuk Peninsula.

RATIONALE:

The study provides background information on habitat use and movements relevant to population management, delineation, harvest management, hydrocarbon development, and climate change. The study is designed to examine polar bear habitat use and movements.

OBJECTIVES:

To deploy GPS satellite collars on adult female polar bears (> 5 years old);

To use data to assess sea ice conditions; and

To understand the polar bear prey, i.e. seals.

METHODS:

Polar bears are located by helicopter and immobilized. Satellite collars are placed on adult females (> 5 years old). All collars are equipped with a remote release mechanism to ensure drop-off when the batteries have expired.

RESULTS AND MAIN CONCLUSIONS:

Ten GPS collars were deployed on adult females. Their movements are monitored by satellite. Ongoing analyses for utilization, distribution and habitat selection will be completed in 2011.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term monitoring of habitat use and movement is a recognized component of polar bear population monitoring. Given offshore hydrocarbon development, this project provides meaningful and current data required for environmental impact assessment.

PARTNERS:

Environment and Natural Resources – Inuvik Region
Environment Canada
Polar Continental Shelf Project
United States Department of the Interior–Mineral Management Service

COMMUNITY INVOLVEMENT:

Presentations and input were obtained from both the Inuvialuit Game Council and the Wildlife Management Advisory Councils (NWT and NS). Requests to limit collaring to adults and to keep the number of collars to a minimum were suggested by the Tuktoyaktuk HTC and were followed in the study.

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Photo: A.E. Derocher

Latitudinal Impacts on Carry-Over Effects in a Neotropical Songbird *(Dendroica petechia)*

Period: May 15, 2010 to July 23, 2010

Main Investigator: Dr. David Green, Simon Fraser University

Wildlife Research Permit Number: WL007411

LOCATION:

Inuvik, NWT.

Photo: S.Topp

RATIONALE:

Long-term declines in migratory bird abundance have led to renewed interest in whether migratory bird populations are most affected by events on their breeding grounds, on wintering areas, or on migration. Recent migratory songbird studies have shown that events on wintering grounds can carry-over into the breeding season and influence individual reproductive success and the dynamics of populations on the breeding grounds. This is important given long-term declines in many songbird species. By using direct monitoring of breeding pairs and by testing the stable isotope composition of their feathers, we plan to link reproductive success to locations and habitats these birds occupied in the winter. We will look at how variation in climatic conditions and winter habitat use influence the arrival times, condition and the number of offspring had by these birds.

OBJECTIVES:

To test the generality of winter habitat impacts on breeding success ("carry-over" effects) in neotropical songbirds by studying a species on the western flyway; and

To determine whether there is a latitudinal impact on carry-over effects. It is expected that carry-over effects will be more pronounced for birds breeding in more northerly locations.

METHODS:

Yellow warblers were mist netted when they arrived in the Inuvik area. Each bird had standard body metrics taken, six feathers sampled – three greater coverts (which are moulted on wintering grounds), two primary coverts and one retrice (moulted on breeding grounds), and was colour banded for identification purposes. Birds were then released and monitored: their territories identified, nests located and breeding success recorded (date of first egg, nestling number, nestling growth, and nestlings fledged). Sixty breeding pairs (120 birds) were monitored from their arrival to when their young fledged. Forty-two of the birds captured within the study-site had been banded in 2009. Of these, 38 were older birds that had returned to their previous years' breeding territory and four were second-year birds that had been banded as fledglings in 2009. Five other individuals that had been banded in 2009 were sighted in and around the study area but were not recaptured in 2010. In total, 116 adult birds were given colour and federal bands and 186 fledglings were given federal bands.

RESULTS AND MAIN CONCLUSIONS:

Stable isotope data from feather samples are currently being analyzed. Data for both 2009 and 2010 will be analyzed together for carry-over effects. Stable isotope signatures from 2009 suggest that the wintering location and wintering habitat for Inuvik birds differ from that of yellow warblers in Revelstoke, BC.

Mean density of breeding birds in the study site was 4.05 pairs/hectare. The number of nestlings hatched per clutch averaged four and individual nest success was 67.5% (n=71 nests) while pair success (whether a pair produced one successful clutch within the season) was 81% (n=53 known-fate pairs).

LONG TERM PLANS AND RECOMMENDATIONS:

We plan to continue monitoring this banded population for at least one more year. In addition to stable isotope data collected, band returns and productivity data will allow for the calculation of population demographics. The Inuvik study sites appear to be high density, productive breeding sites: breeding pair density is three times greater than at our sister study site in British Columbia.

PARTNERS:

Canadian Wildlife Service
Aurora Research Institute (logistical support)

COMMUNITY INVOLVEMENT:

Advice from local birders on high density breeding sites was obtained in 2009. Inuvik Town Council was consulted as recommended by the Wildlife Management Advisory Council (NWT). Town Council suggested youth involvement and our work included the participation of one summer student (employed through the IPY program at the Aurora Research Institute). In 2010, Anna Drake gave a talk on migratory birds to the outdoor education class at Samuel Hearne Secondary School and students David Halpine, Lance Gray and Jon Amos, participated in mist netting and banding activities early in the season. Once data is available, follow up reports will be given to the Inuvik Hunter and Trappers Committee and the Nihtat Gwich'in Renewable Resources Council.

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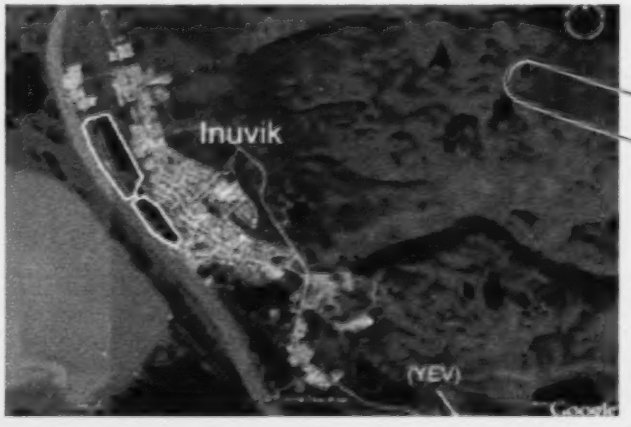

Survey Area outlined in white

Population Management of Geese and Swans in the Inuvialuit Settlement Region Using Aerial Surveys and Banding Studies

Period: Summer 2010

Main Investigator: Myra Robertson, Waterfowl Population Management Biologist, Western Arctic, Canadian Wildlife Service

Wildlife Research Permit Number: WL007418

LOCATION:

Since 1989, the Canadian Wildlife Service (CWS) has conducted aerial surveys and banded geese throughout the Inuvialuit Settlement Region (ISR) to monitor the abundance and productivity of geese and swans in the area.

Goose banding operations took place at known moulting areas (where previous banding occurred) at the Mackenzie Delta, Tuktoyaktuk Peninsula and Anderson River on the mainland of the ISR.

RATIONALE:

The ISR of the Western Canadian Arctic is an important breeding and moulting area for the greater white-fronted goose, Canada goose, lesser snow goose, brant, tundra swan, and several other species of waterfowl. Information on bird numbers, distribution, habitat requirements, survival, and productivity is needed to determine if current local and international harvest levels are sustainable, and to ensure that populations are conserved for the long-term use by the Inuvialuit and other people residing or hunting within the migratory range of these species. This information is also timely for establishing baseline population information for areas of potential oil and gas development in the Mackenzie Delta.

OBJECTIVES:

To monitor waterfowl populations in the ISR;

To evaluate the effect of harvest and other stressors on Western Arctic populations of waterfowl; and

To monitor migration routes, harvest rates, and survival rates of the ISR mainland goose populations.

METHODS:

In July, flightless adult and young geese are captured though helicopter drives, and banded with numbered metal leg-bands. The information received by hunters helps determine the migration routes, seasonal distributions, survival, and harvest rates for these birds.

Photo: Canadian Wildlife Service

RESULTS AND MAIN CONCLUSIONS:

Helicopter surveys were not conducted this year at the Kendall Island and Anderson River snow goose colonies. In the future, these surveys will be conducted at three year intervals to determine the colony size at each location, as long as the total number of adults remains above a set threshold. A decrease in the number of adults would warrant possible further management actions. In July 2010, 1,143 white-fronted geese, 2 white-fronted/snow goose hybrids and 24 Canada/cackling geese were banded at the Mackenzie Delta, Tuktoyaktuk Peninsula and Anderson River. In addition, we recaptured 23 white-fronted geese that were banded in previous years.

Band recoveries from banding efforts show there has been an eastward shift in the winter distributions of white-fronted geese from the Western Arctic compared to historical data. A higher proportion of geese were recovered in Louisiana and the Mississippi Alluvial Valley in Arkansas in recent years.

Annual summary reports are sent to regional contacts with our wildlife research permit applications.

LONG-TERM PLANS AND RECOMMENDATIONS:

Canadian Wildlife Service is currently undergoing a review of all bird monitoring programs in order to improve them. The results of the review will shape future monitoring activities for waterfowl populations in the Western Arctic. Pending review results, future plans are to continue banding white-fronted geese and Canada/cackling geese on the ISR mainland in 2011. This data will improve our understanding of survival rates and movement of waterfowl from the ISR region to staging and wintering areas in the south. Our data has been, and continues to be an important reference as interest in developing natural resources in the Mackenzie Delta region grows.

PARTNERS:

Wildlife Management Advisory Council (NWT)
Polar Continental Shelf Project
United States Fish and Wildlife Service
Arctic Goose Joint Venture

COMMUNITY INVOLVEMENT:

Canadian Wildlife Service has reviewed all concerns and comments provided by the communities and discussed solutions directly with them. The main concern received by the communities was the opportunity for local hiring. The banding operations rely on transportation by helicopter and are weight restricted. This limits the number of passengers, banding gear and fuel that can be carried at one time, as well as distance travelled before refueling. As such, opportunities for local participation are limited. In 2010, we were able to hire Kayla Nuyaviak, a local student from Tuktoyaktuk, to help with banding birds.

CONTACTS:

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Delineation of Populations and Migratory Pathways of Yellow-billed Loons

Period: July 8, 2010 to August 30, 2010

Main Investigator: Dr. Joel Schmutz, Research Wildlife Biologist, United States Geological Survey

Wildlife Research Permit Number: WL005695

LOCATION:

Daring Lake Research Station (64° 52.25'N, 111° 34.82'W), about 300 km northeast of Yellowknife, NWT.

RATIONALE:

The yellow-billed loon is a rare bird that nests only in tundra habitats. Because of conservation concern for this species, the yellow-billed loon has been listed in the United States (US) as warranted for protection under the *Endangered Species Act*. By understanding its migration pathway and wintering areas, we can better assess what hazards this species is exposed to when not on breeding areas. Our goal was to capture breeding loons and surgically implant satellite transmitters. These transmitters allow us to track the loons throughout the year, along their entire migration. Similar work in Alaska has tracked yellow-billed loons to wintering areas as far west as northeast China.

OBJECTIVES:

To locate pairs of yellow-billed loons, using existing knowledge and surveys from boat and airplane;

To capture up to 15 yellow-billed loons, one at a time;

To surgically implant a satellite transmitter into each captured loon;

To obtain a small blood sample to allow us to look at DNA and contaminants;

To release the loon where it was captured;

To monitor the loons' movements for up to two years; and

To provide summaries of our captures, subsequent movement patterns, and blood testing to local communities, Environment and Natural Resources (ENR), and Canadian Wildlife Service (CWS).

METHODS:

We flew a floatplane over lakes to look for yellow-billed loons and their nests. Once we located a pair of yellow-billed loons, we set up a spring-loaded hoop, with netting, around their nest so that when a loon sat back on its nest the netting was propelled over the loon, thus capturing it. Loon eggs had been carefully collected, protected and replaced with wooden replicas to insure egg survival. Once captured, we transported the loon back to our veterinarian at the research station. The vet anesthetized the loon and then implanted a transmitter into its abdomen, with the antenna protruding from the back left side of the bird. Immediately post-surgery, we measured the size of the loon and sampled two feathers and blood for assessment of exposure to mercury. Once fully alert and conscious, the loon was released back onto its nest lake within 2 hours of capture. We revisited all nest sites 1 to 8 days post-capture and then again on August 30, 2010. A subset of nest sites was also revisited August 1, 2010.

RESULTS AND MAIN CONCLUSIONS:

During July 9-16, 2010, we captured 15 yellow-billed loons from a total of nine nest sites (from six nest sites, we captured both the male and female). Seven of the nine nest sites failed to hatch young. During our last post-surgery visit to capture sites, adults from the other two sites were observed with young that were approximately six weeks old. Marked loons departed the Daring Lake area between September 20–October 23, 2010 and as of November 29, 2010, all 15 loons are alive and providing data from the current wintering location along the Pacific coastline. Most (nine) have migrated to the Hecate Strait area of northwest British Columbia. The remainder are wintering in southern Alaska waters, with the farthest west being the south central Alaska Peninsula. Fourteeen of 15 migrated overland in a southwesterly direction from Daring Lake. Only one marked loon migrated north to the Coronation Gulf, south of Victoria Island, and then migrated west and followed the entire northern and western Alaska coastlines until arriving near Kodiak Island, and is now wintering in close proximity to two other marked loons that chose the alternative southwesterly, overland migration. In comparison to yellow-billed loons marked in Alaska, these loons were smaller in body size, initiated fall migration later and wintered to the east. The most westerly of the Daring Lake loons is wintering a bit east of the eastern most location of all loons marked previously in Alaska. We suspect that most loons wintering in southeast Alaska and British Columbia are from Canadian breeding grounds, whereas Alaskan breeders winter in Asia or southwest Alaskan waters. Results of mercury analyses are still pending.

LONG-TERM PLANS AND RECOMMENDATIONS:

We anticipate that some of the transmitters will continue providing data for two years, increasing our knowledge about migration patterns and return to breeding areas. The smaller body size, different migration path and wintering area of these loons, compared to those in Alaska, suggest that there may be genetic differences between populations. Using DNA from blood samples obtained, this idea will be examined. We think it is important to do similar work in more northern Canada, e.g., Victoria Island, where many loons breed as these loons may exhibit migration and wintering behaviour more similar to Alaskan loons than Daring Lake loons. Once mercury analyses are completed, we will provide an updated report with these results, as well as additional information on migration patterns.

PARTNERS:

Environment and Natural Resources
United States Geological Survey
Biodiversity Research Institute
Air Tindi Ltd.
Hoarfrost River Huskies Ltd.
Fairwinds Wildlife Services
Joachim Obst

COMMUNITY INVOLVEMENT:

We sent letters of consultation (a 14-page description of our project) and community recommendation forms to the following: Wek'èezhìi, Yellowknives Dene First Nation, North Slave Métis Alliance, and Łutselk'e First Nation, as well as to the Yellowknife office of ENR, and followed with telephone calls. Our lone community response indicated approval. No responses were received to our solicitation of their more direct involvement in the project.

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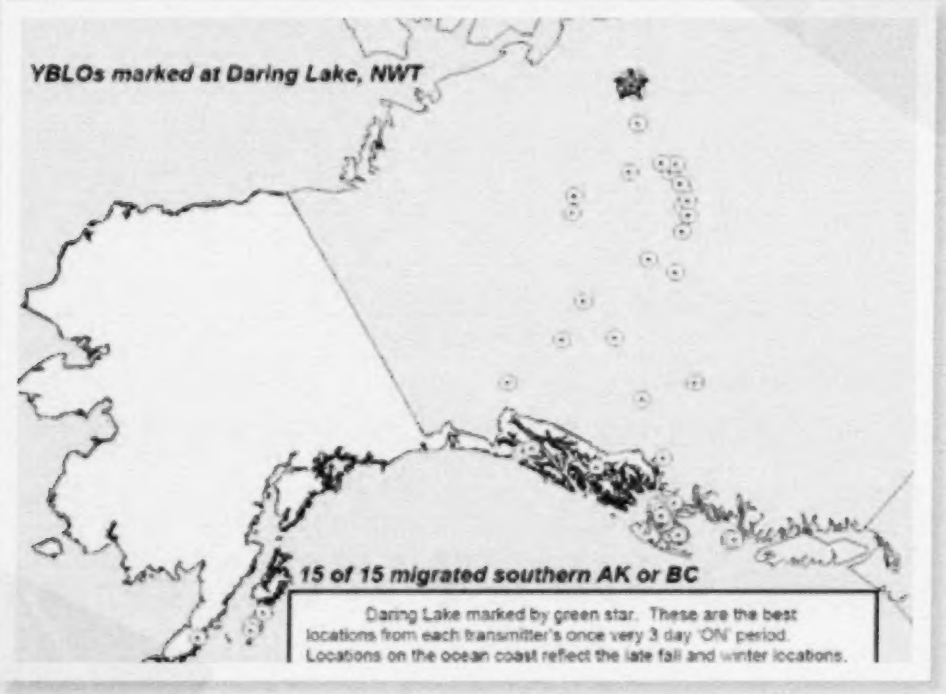
YBLOs marked at Daring Lake, NWT
15 of 15 migrated southern AK or BC
Daring Lake marked by green star. These are the best locations from each transmitter's once very 3 day 'ON' period. Locations on the ocean coast reflect the late fall and winter locations.

Photo: Canadian Wildlife Service

Shorebird Surveys in the Mackenzie Delta, Northwest Territories

Period: June and July, 2010

Main Investigator: Canadian Wildlife Service, Environment Canada

Wildlife Research Permit Number: WL007414

LOCATION:

A temporary tent camp was stationed at Taglu Tower on Fish Island in the outer Mackenzie Delta, NWT, Kendall Island Bird Sanctuary (KIBS).

RATIONALE:

Arctic breeding shorebird populations continue to decline. Understanding shorebird dynamics (i.e. nest success, chick survival rates, adult survival, breeding site fidelity and population age structure) on the breeding sites and collection of genetic samples may help us determine why these declines are occurring.

This year we instituted research protocols in cooperation with the Arctic Shorebird Demographic Network (ASDN), a North American working group that is working to determine what factors are limiting the populations of Arctic nesting shorebirds and contributing to declines in shorebird numbers.

OBJECTIVES:

To estimate population sizes of shorebirds breeding in the Mackenzie Delta;

To determine distribution, abundance and habitat relationships for each species;

To gather genetic information on shorebirds that can be used to determine migration patterns; and

To collect data that describes the characteristics of shorebird populations breeding in the Mackenzie Delta.

METHODS:

We intensively surveyed shorebird habitat on Taglu and Fish Islands for shorebird nests; monitored nests every three to five days and described the nest habitat; and conducted rapid style surveys of upland and lowland habitat on the southern end of Niglintgak Island as well as coastal habitat within KIBS.

We banded adult and juvenile individuals of semipalmated sandpipers, pectoral sandpipers, stilt sandpipers, red-necked phalaropes, whimbrel and semipalmated plovers. Genetic samples (blood and feathers) were collected from semipalmated sandpipers, red-necked phalaropes and whimbrel.

RESULTS AND MAIN CONCLUSIONS:

We found a total of 41 shorebird nests on Taglu, Fish and Niglintgak islands and banded 33 adults and 59 juveniles. The majority of nests were found outside of intensive survey plots with only four shorebird nests found within the six intensively surveyed plots. In previous years, pectoral sandpipers have been prevalent on Taglu and Fish Island plots, however this year they were absent. Pectoral sandpipers can change breeding sites from year to year so that may explain the lack of nests in 2010. We also found more long-billed dowitcher nests (n=4) this year than in previous years. This species is typically elusive and we have never found more than one or two nests in a given year.

LONG-TERM PLANS AND RECOMMENDATIONS:

The shorebird camp in the Mackenzie Delta is one of two Arctic Programs for Regional and International Shorebird Monitoring (PRISM) Tier 2 (long term) shorebird monitoring sites in Canada. It is also part of the newly created Arctic Shorebird Demographic Network (ASDN) which is drawing together arctic-breeding shorebird demographics from a variety of sites spread around the Arctic, using a standard set of protocols so the data can be part of a central database.

Additional studies in the area are dependent on the outcome of the Joint Review Panel's decision on the Mackenzie Gas Project (MGP). Should the MGP be approved, further studies are necessary to monitor the impact of development on shorebirds breeding in the affected area.

PARTNERS:

Canadian Wildlife Service (CWS)
Program for Regional and International Shorebird Monitoring (PRISM)
Cumulative Impacts Monitoring Program, Indian and Northern Affairs Canada
Manomet Centre for Conservation Science

COMMUNITY INVOLVEMENT:

Since 2005, Canadian Wildlife Service Shorebird Program has hired nine students from local communities including Fort McPherson, Yellowknife, Inuvik, and Tuktoyaktuk, to work as part of our field team. Our research is supported by the Wildlife Management Advisory Council (NWT), the wildlife management board for the Inuvialuit Settlement Region. We regularly communicate with the Hunters and Trappers Committees in Inuvik and Tuktoyaktuk about our project and to obtain recommendations for research.

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The 2010 International Trumpeter Swan Survey in the Northwest Territories

Period: August 2010

Main investigator: Myra Robertson, Waterfowl Population Management Biologist, Western Arctic, Canadian Wildlife Service

Wildlife Research Permit Number: WL005029

LOCATION:

In the Northwest Territories, the rocky mountain population is surveyed in the southeast Dehcho region.

RATIONALE:

Through a variety of conservation efforts, the North American trumpeter swan population has steadily recovered from near extinction since the 1930s.

As part of ongoing population monitoring, the International Trumpeter Swan Survey is used to identify areas and habitats used by swans and to estimate the population size throughout their range.

Standardized provincial and territorial-wide surveys provide accurate population information, allow for habitat conditions to be assessed and if necessary, appropriate management action to be implemented.

OBJECTIVES:

To determine the abundance and distribution of trumpeter swans across their breeding range;

To determine composition of trumpeter swan age and social classes; and

To record the number of broods and young in order to estimate breeding success and productivity.

METHODS:

The range for trumpeter swans expands as the population recovers; a complete census is both logistically difficult and expensive. Therefore a stratified-random sampling approach was used in 2010 to reduce survey effort while maintaining precision. Topographic map-sheets (1:50,000) were used as sampling units and were randomly selected based on expected abundance: 1) no swans expected, 2) 1-10 swans expected, and 3) 11+ swans expected. Expected abundance was based on habitat and observations from previous surveys.

Aerial surveys were conducted over a four day period in late August using a Kodiak fixed-wing aircraft. Survey effort was targeted towards wetland areas within the randomly-selected map sheets survey plots in the southwest Dehcho region and northern Alberta between Fort Simpson, Nahanni Butte, Wrigley and Fort Liard. Surveys were flown at an altitude of 1000 ft. The number of trumpeter swans, age and social class, number of broods and number of young in each brood was recorded.

RESULTS AND MAIN CONCLUSIONS:

A total 249 swans (182 adults/subadults and 67 cygnets) were observed within the surveyed areas and 60 (48 adults/subadults and 12 cygnets) were observed outside the survey areas (incidentals). Areas covered by both the 2005 and 2010 surveys were similar in both the distribution and number of swans observed, although the mean brood size was slightly higher in 2010 (2.91) compared to 2005 (2.37).

Results from all areas surveyed within the rocky mountain population (Northwest Territories, Yukon, British Columbia, and Alberta) range are being summarized and further analysis is being conducted to determine a population and productivity estimate. Final results for the rocky mountain population

are expected to be available by spring 2011. Report will be available online at: http://library.fws.gov/birdpublications.html.

LONG-TERM PLANS AND RECOMMENDATIONS:

The information from this study will be used to monitor trends in the trumpeter swan population and be incorporated into the *International Swan Management Plan*.

PARTNERS:

United States Fish and Wildlife Service
Parks Canada Agency
Alberta Sustainable Resource Development

COMMUNITY INVOLVEMENT:

The Canadian Wildlife Service (CWS) has reviewed all concerns and comments provided by the communities and discussed solutions directly with them. The main concern received by the communities was the opportunity for local hiring. CWS was unable to hire local help because of weight and space restrictions associated with the aircraft.

CONTACTS:

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Mike Klaczek, Caribou Consultation Biologist,
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Photo: M. Klaczek

Identification of Beaufort Sea Migration Corridor for Sea Ducks

Period: August 5, 2010 to August 18, 2010

Main Investigator: Blake Bartzen, Habitat Biologist, Canadian Wildlife Service, Inuvik

Wildlife Research Permit Number: WL007415

LOCATION:

McKinley Bay, NWT

RATIONALE:

The development of offshore oil production facilities is currently underway in important sea duck migration corridors along the Beaufort and Chukchi seas. Various independent surveys of sea ducks in that area since the 1950s have documented the migratory passage of hundreds of thousands of king eiders, long-tailed ducks, and common eiders during fall and spring (between the breeding areas in western and central arctic Canada and the wintering areas offshore near Alaska and Russia). Existing data suggest dramatic declines in the western arctic breeding population of all three species. If oil developments are situated within the migration corridors, large portions of sea duck populations could be affected. Detailed information on location and timing of use of the migration corridor is needed to better predict and mitigate any adverse effects of offshore development on sea ducks.

OBJECTIVES

To determine specific migration routes for declining western Canadian breeding populations of long-tailed ducks;

To document temporal and spatial relationships of migrating long-tailed ducks to pack ice, islands, shorelines and other physical features of the Beaufort Sea; and

To identify wintering, staging and moulting areas, and their affiliation with specific breeding areas.

Photo: L. Pirie
Duck released after satellite transmitter surgically implanted: note the antenna

METHODS:

Moulting long-tailed ducks were captured from August 6-17, 2010. Flocks of ducks were herded using three to five boats and kayaks towards a monofilament gill net suspended in shallow water. Ducks were induced to dive when they approached the net by generating loud noises or rushing towards the ducks with the boats. Ducks that became entangled in the net were quickly removed. All captured ducks were fitted with metal leg bands issued by the United States Fish and Wildlife Service. A total of 71 long-tailed ducks were captured, and 33 ducks (22 females and 11 males) had satellite transmitters surgically implanted by a veterinarian. All ducks were released after being processed or having recovered from surgery.

RESULTS AND MAIN CONCLUSIONS:

This was the second year of a capture and tagging effort for long-tailed ducks at McKinley Bay; 25 ducks (23 females and 2 males) were tagged there in August 2009 (Permit WL007401). By mid-to late September 2009, the ducks began to migrate along the coast of northern Canada, Alaska, the Queen Charlotte Islands of British Columbia, and the Kamchatka Peninsula of Russia. The birds moved northward along the Russian and Alaskan coasts during spring migration, and five of the six transmitters that made it through spring migration indicated that those birds likely bred in the Northwest Territories, relatively close to McKinley Bay. The sixth transmitter that made it through spring migration indicated that the bird moved along the Russian coast in spring, and may have nested in northern Russia. Another bird migrated westward along the northern coast of Russia, but the transmitter ceased functioning before spring migration was complete. By early September 2010, all of the 2009 transmitters ceased consistently providing locations.

The long-tailed ducks captured in 2010 followed a similar migration pattern as the 2009 ducks, and are currently wintering off the coasts of Russia and southern Alaska. We anticipated these transmitters will function through the 2011 breeding season and we should receive our last data from these transmitters in early autumn 2011.

LONG-TERM PLANS AND RECOMMENDATIONS:

The fieldwork for this project has been completed, and after the transmitters cease functioning the results of this study will be published by March 2012. The results of this study will: 1) help delineate populations of sea ducks using habitat in the Inuvialuit Settlement Region, 2) identify key habitat areas for sea ducks, and 3) provide baseline information to measure and mitigate potential effects of future developments.

PARTNERS:

Sea Duck Joint Venture
United States Fish and Wildlife Service
Conoco-Phillips (Alaska and Canada)

COMMUNITY INVOLVEMENT:

A meeting was held in Tuktoyaktuk (the community nearest McKinley Bay) in January 2009, to discuss this proposed research; members of the local Hunters and Trappers Committee (HTC) and the general public were present. With the HTC's approval, we hired a licenced and insured outfitter, Chuck Gruben, from Tuktoyaktuk. Chuck provided his boat along with his services for the duration of the time we were at McKinley Bay. Chuck assisted with all aspects of duck capturing and his participation and knowledge of the area was invaluable.

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Western Canada Cooperative Duck Banding Program at Willow Lake, Sahtu Settlement Area, Northwest Territories

Period: August 2010

Main investigator: Richard Popko, Wildlife Technician, Environment and Natural Resources, GNWT, Sahtu Region

Wildlife Research Permit Number: WL005156

LOCATION:

Willow Lake, Tulita, NWT

RATIONALE:

Dabbling ducks are migratory waterfowl that are hunted throughout their range. Banding large numbers of ducks across their summer range before the start of the hunting season and then documenting band returns from successful hunters allows us to plot the harvest distribution. The data is also useful in identifying migration and wintering grounds, which assists in efforts to protect habitats through joint ventures as part of the North American Waterfowl Management Plan.

OBJECTIVE:

To band pre-hunting season puddle ducks.

METHOD:

Live-trap, band, and release puddle ducks.

RESULTS AND MAIN CONCLUSION:

Funding was not available for this year. Project postponed until 2011.

LONG-TERM PLANS AND RECOMMENDATION:

Long-term project started in 1995, anticipated to continue August 2011.

PARTNERS:

United States Fish and Wildlife Service
Environment and Natural Resources
Sahtu Renewable Resources Board
Tulita Renewable Resources Council

COMMUNITY INVOLVEMENT:

Usually two assistants from Tulita are hired to work with a biologist for the month afield. They are hired by the Tulita Renewable Resources Council and the Sahtu Renewable Resources Board.

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Cooperative Waterfowl Population Surveys in the Northwest Territories

Period: Spring 2010

Main investigator: James S. Wortham, Chief of Waterfowl Population Surveys, United States Fish and Wildlife Service

Wildlife Research Permit Number: WL005754

LOCATION:

The surveys cover much of the Mackenzie Valley region from the southern border of the NWT to the Mackenzie Delta region.

RATIONALE:

The Northwest Territories is one of the most important breeding and summering areas for ducks, geese, and swans in North America. Information on bird numbers, distribution, and population trends is needed to determine if current local and international harvest levels are sustainable, and to ensure that populations are conserved for the long-term use and appreciation by northern residents and all the other people residing within the migratory range of these species.

OBJECTIVE:

To determine the size and species composition of the breeding populations of ducks and other waterfowl in the Mackenzie River drainage.

METHODS:

The survey procedure involves flying a single pass along straight transects in a single engine amphibious Cessna aircraft at a height of 150 feet. The procedures followed in conducting this survey are contained in the *Standard Operating Procedures for Aerial Waterfowl Breeding Ground Population and Habitat Surveys in North America, Section III, Revised 1987* document.

Two observers record all waterfowl species observed within 200 m (or 660 feet) on each side of the aircraft. All observations are geo-referenced and can later be summarized at transect, strata, provincial / territorial and continental levels.

RESULTS AND MAIN CONCLUSIONS:

The entire survey area experienced an earlier-than normal break-up and early spring. In sharp contrast to the 2009 late spring, the majority of habitats were ice-free for arriving waterfowl. Good waterfowl production was predicted across most of this region. Overall, breeding waterfowl habitat conditions in the Northwest Territories were rated as "fair" in the southernmost survey portion to "good" for the majority of the survey area.

The 2010 total breeding duck estimate in central and northern Alberta, northeastern British Columbia, and the Northwest Territories was 26% higher than last year and 23% above the long-term average (1955-2009).

Counts of mallards were 32% higher than in 2009, and 33% higher than the long-term average. The American wigeon estimate was similar to 2009 and 34% lower than the long-term average. Green-winged teal were similar to 2009 and 90% above the long-term average. Gadwall, blue-winged teal, northern shoveler, northern pintail, redhead, and canvasback estimates were all similar to 2009 and

their long-term averages. The scaup estimate was 41% higher than 2009 but similar to the long-term average.

The 2010 Waterfowl Population Status report can be accessed online at: http://www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus/Waterfowl/StatusReport2010_Final.pdf

LONG-TERM PLANS AND RECOMMENDATIONS:

The Waterfowl Population Survey Program has evolved into the largest and most reliable wildlife survey effort in the world. For more than 50 years, cooperative waterfowl surveys have been performed by United States Fish and Wildlife Service (USFWS), Canadian Wildlife Service, state and provincial biologists and non-government partners. Survey results determine the status of North America's waterfowl populations, play an important role in setting annual waterfowl hunting regulations, and help guide the decisions of waterfowl mangers throughout North America.

These surveys are to continue until a more cost effective way is discovered to manage the North American waterfowl population.

PARTNERS:

United States Fish and Wildlife Service (USFWS)
Canadian Wildlife Service (CWS)

COMMUNITY INVOLVEMENT:

Canadian Wildlife Service has reviewed all concerns and comments provided by the communities and discussed solutions directly with them. The main concerns received by the communities are opportunities for local hiring and disturbance to wildlife. The USFWS is unable to hire local help because of liability and legal issues as well as constraints in the US civil service hiring regulations. Also, there are relatively few transects flown over a vast area once a year. It is expected that the surveys will have a negligible effect on waterfowl and other wildlife.

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Photo: US Fish and Wildlife Service

Aerial Waterfowl Survey on Banks Island and Tuktoyaktuk Peninsula, 2010

Period: June 21, 2010 to June 29, 2010

Main investigators: Deb Groves, Ed Mallek, Tim Moser, United States Fish and Wildlife Service, Migratory Bird Management

Wildlife research permit number: WL007413

LOCATION:

Tuktoyaktuk Peninsula and the southern two-thirds of Banks Island, NWT.

RATIONALE:

The Canadian Arctic is an important breeding area for several species of waterfowl (e.g. Canada geese, greater white-fronted geese, king eiders, long-tailed ducks, and tundra swans). The population status and trends of waterfowl species have been monitored via programs established on wintering areas or at points along migration routes, with little or no information collected on their Arctic breeding grounds. For some species, e.g. king eiders and long-tailed ducks, existing quantitative data are extremely limited and apply only to broad-scale population levels. This lack of information hinders the ability of managers to understand the species' population dynamics and to identify causal factors associated with perceived changes in population sizes. Data on spatial distribution and abundance from breeding areas greatly complement information gathered elsewhere and allow for more effective monitoring and better-informed management decisions.

OBJECTIVES:

To obtain population-size estimates and distribution information for waterfowl and other bird species within the study area; and

To use the data collected to assist wildlife managers in efforts to design a long-term monitoring plan for birds in the Canadian Arctic.

METHODS:

Transects placed systematically at 10 km intervals across the survey areas were flown once with a turbine beaver at 40 m altitude and 155 kph. Two observers enumerated and recorded all birds (except shorebirds and small passerines) and large mammals observed within 200 m of the aircraft. We also recorded the locations of observations via a GPS unit interfaced with the data-collection program.

RESULTS AND MAIN CONCLUSIONS:

Data analysis is ongoing. A final summary report, including population estimates and distribution maps by species, will be produced in 2011 and will be distributed to interested parties. The raw data (georeferenced bird and mammal observations) will also be available to Government of the Northwest Territories upon request.

LONG-TERM PLANS AND RECOMMENDATIONS:

The results from our 2010 survey, combined with data collected in other areas of the central Canadian Arctic in recent years, will be used to inform the design of a long-term monitoring survey of birds breeding in the Canadian Arctic.

The final report will eventually be available at the United States Fish and Wildlife Service (USFWS) region 7 website: http://alaska.fws.gov/mbsp/mbm/waterfowl/reports.htm

PARTNERS:

Canadian Wildlife Service
United States Fish and Wildlife Service
Central Flyway Council
Sea Duck Joint Venture
Arctic Goose Joint Venture
Mississippi Flyway Council

COMMUNITY INVOLVEMENT:

A board member from each of the Tuktoyaktuk and Sachs Harbour Hunters and Trappers Committees was invited to fly with us for part of a day to learn about our survey. However, neither committee responded to our invitation.

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Photo: US fish and Wildlife Service

Abundance and Productivity of Waterfowl and Other Aquatic Birds Breeding in the Boreal Forest

Period: Summer 2010

Main Investigator: Myra Robertson, Waterfowl Population Management Biologist, Western Arctic, Canadian Wildlife Service

Wildlife Research Permit Number: WL005689

Photo: Canadian Wildlife Service

LOCATION:

Yellowknife, NWT, 38 km^2 study area (YKSA) that borders the Yellowknife Highway #3.

RATIONALE:

Every spring, millions of breeding waterfowl and other aquatic birds are attracted to the boreal forest. It is one of the most important breeding habitats for waterfowl in North America, second only to the 'prairie pothole' region. The boreal forest becomes increasingly important during years of drought in the prairies, when it acts as a haven for ducks that might otherwise nest further south. However, this region is increasingly threatened by a wide range of stressors including resource development and climate change. Declines in populations of boreal nesting species, such as scaup and scoters, have been detected at a continental scale.

There is a severe lack of information on the ecology of northern ducks and other aquatic birds such as grebes and loons, and the contribution of boreal populations to the overall North American populations of aquatic birds is largely unknown. Similarly, the factors influencing the size and productivity of northern duck populations (including the impact of spring harvest) are poorly understood. Long term monitoring data are required for the conservation of this valuable resource.

OBJECTIVES:

To monitor population trends and productivity of boreal waterfowl and aquatic bird populations near Yellowknife; and

To determine factors that limit the size, composition, and productivity of the breeding populations of aquatic birds near Yellowknife.

METHODS:

Ponds within 400 m of the road were surveyed intensively on foot or canoe once a month from May until August. May and June surveys provided an estimate of breeding pairs for early and late migrant waterfowl respectively. The surveys during July and August were used to estimate waterfowl production on the study area. During surveys, all ducks sighted on the ponds were recorded according to species, sex, and social status (lone, paired, or flocked). The number of ponds surveyed in this manner has been reduced from 575 to 353 because of the increased effort required to survey these ponds due to the reconstruction of Highway #3, which hindered access to certain areas on our study area.

RESULTS AND MAIN CONCLUSIONS:

The number of wigeon and bufflehead pairs were similar to the long-term average, while fewer pairs of lesser scaup, mallard and green-winged teal were observed in 2010. Observations of ring-necked duck have steadily increased over the past 26 years and the number of pairs were once again well above the long-term average.

Duckling production was average for lesser scaup in 2010. Bufflehead and mallard production was slightly above average, and green-winged teal and wigeon production was slightly below average.

The number of horned grebe pairs and young observed on the YKSA was slightly below average in 2010, indicating poorer than average production. Red-necked grebe pair numbers were slightly above average with a very high number of young observed, indicating good production this year.

The western population of horned grebe was recently assessed as *Special Concern* by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Our data was incorporated into their assessment. The report can be accessed online:

http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_horned_grebe_0809_e.pdf

Annual summary reports are sent to regional contacts with our wildlife research permit applications. A document summarizing data and trends on the YKSA is in progress and expected in the near future.

PARTNERS:

Canadian Wildlife Service

LONG-TERM PLANS AND RECOMMENDATIONS:

CWS is currently undergoing a review of all bird monitoring programs in order to improve them. The results of the review will shape future monitoring activities for boreal waterfowl and aquatic bird populations. Pending a review of results, future plans are to continue monitoring boreal waterfowl and aquatic bird populations near Yellowknife at two year intervals, with the next survey in 2012. Our data is an important reference for management decisions affecting boreal waterfowl populations. Information gained on other waterbird species, such as red-necked and horned grebes, provide valuable information for population trends and productivity for the boreal forest.

COMMUNITY INVOLVEMENT:

CWS reviewed all comments provided by the communities and discussed solutions directly with them. Each year, CWS looks for a local student with a background in biology or renewable resource technology to assist in the field and office. This position is dependent on CWS acquiring adequate funding from outside sources. In 2010, we were able to hire two local students for the summer, Mark Wasiuta and Lukas Madsen.

CONTACTS:

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Photo: Canadian Wildlife Service

Western Canada Cooperative Pre-season Waterfowl Banding Program Mills Lake, Northwest Territories

Period: August 1 to 26, 2010

Main Investigator: David Fronczak, Wildlife Biologist, United States Fish and Wildlife Service

Wildlife Research Permit Number: WL004811

LOCATION:

Mills Lake, 21 miles WNW of Fort Providence, NWT. Banding was conducted within the marsh on the east end of the lake.

RATIONALE:

Pre-season waterfowl banding at Mills Lake, NWT, has been an ongoing event since 1964. Within the 40 years of operations, over 88,000 waterfowl have been banded. Recovery information is used to help determine migration routes, assess harvest pressure, measure vulnerability to harvest pressure, estimate waterfowl production rates, and estimate survival rates of a breeding population. Mills Lake has proven to be an important area for the overall waterfowl population monitoring program by providing a cost effective way to sample a segment of the boreal breeding population.

OBJECTIVE:

To pre-season band 1,000 mallards (of each cohort) for the combined banding effort within the Northwest Territories.

METHODS:

Waterfowl were trapped within baited wire funnel traps. Traps were placed in strategic areas within the marsh and checked daily after baiting has been initiated. Caught birds are then herded into a catch box for processing. A federal aluminum band is placed on the bird's leg and the bird is released. Each band has a unique number which links the collected biological information to that bird. Persons that encounter banded birds are highly encouraged to report the band number to a wildlife agency, Government of the Northwest Territories, (GNWT) or to the Canadian Wildlife Service's Bird Banding Office, 1-800-327-band (2263) or at www.reportband.gov.

RESULTS AND MAIN CONCLUSIONS:

A total of 1,905 ducks were banded (405 mallards, 1,484 northern pintails, one American green-winged teal and 15 American wigeon) over an 18 day period (August 11 – 26). For mallard, northern pintail and green-winged teal, the percentage of young totaled 21% and 78% respectively. Seven previously banded ducks were captured, consisting of three mallard and four northern pintail. Detailed information may be obtained from the *Mills Lake 2010 Pre-Season Banding Report* from the South Slave Environment and Natural Resources GNWT office.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans include the continuation of annual pre-season banding at Mills Lake, NWT. Mills Lake is a unique staging area for waterfowl and logistically feasible for gathering pertinent information on waterfowl for population monitoring and management that pertains specifically to the Mackenzie

River's boreal forest region. Recommendation is for the regional communities and the resource management agency's continued support for pre-season banding within Mills Lake.

PARTNERS:

South Slave Region, Environment and Natural Resources, GNWT (permits)
Fort Providence community (supplies, gas, and logistical assistance)
Canadian Wildlife Service (banding permit and bands)

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Western Canada Cooperative Waterfowl Banding Program – Stagg River Station

Period: August 1 to 26, 2010

Main Investigator: John Klimstra, Wildlife Biologist, United States Fish and Wildlife Service

Wildlife Research Permit Number: WL005692

LOCATION:

Stagg River delta, approximately 13 miles southeast of Behchokǫ̀, NWT.

METHODS:

Waterfowl were caught using modified Benning B-1 and B-2 traps. The Benning B-1 and B-2 traps were used at six locations; located at the southeast end of the marsh and at the rock, which had been extensively used in the past.

RESULTS AND MAIN CONCLUSIONS:

A total of 12 B-2 traps were used over the course of the trapping period. This resulted in 137 trap nights for a total of 749 birds being captured. The total number of birds comprised 656 mallards, 64 American green-winged teal, 11 American widgeon, 4 blue-winged teal, 1 northern pintail 1 northern shoveler, and 1 American black duck. The majority of the birds captured and banded were hatched year birds, possibly indicating a good production year. There was a large case of trap mortality on the last day, which was thought to be caused by mink.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans and recommendations were not submitted.

PARTNERS:

Canada Wildlife Service
United States Fish and Wildlife Service

COMMUNITY INVOLVEMENT:

Local individuals and Canadian Wildlife Service (CWS) assisted with logistical support. CWS employees and summer interns assisted with banding efforts.

CONTACTS:

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Photo: US Fish and Wildlife Service

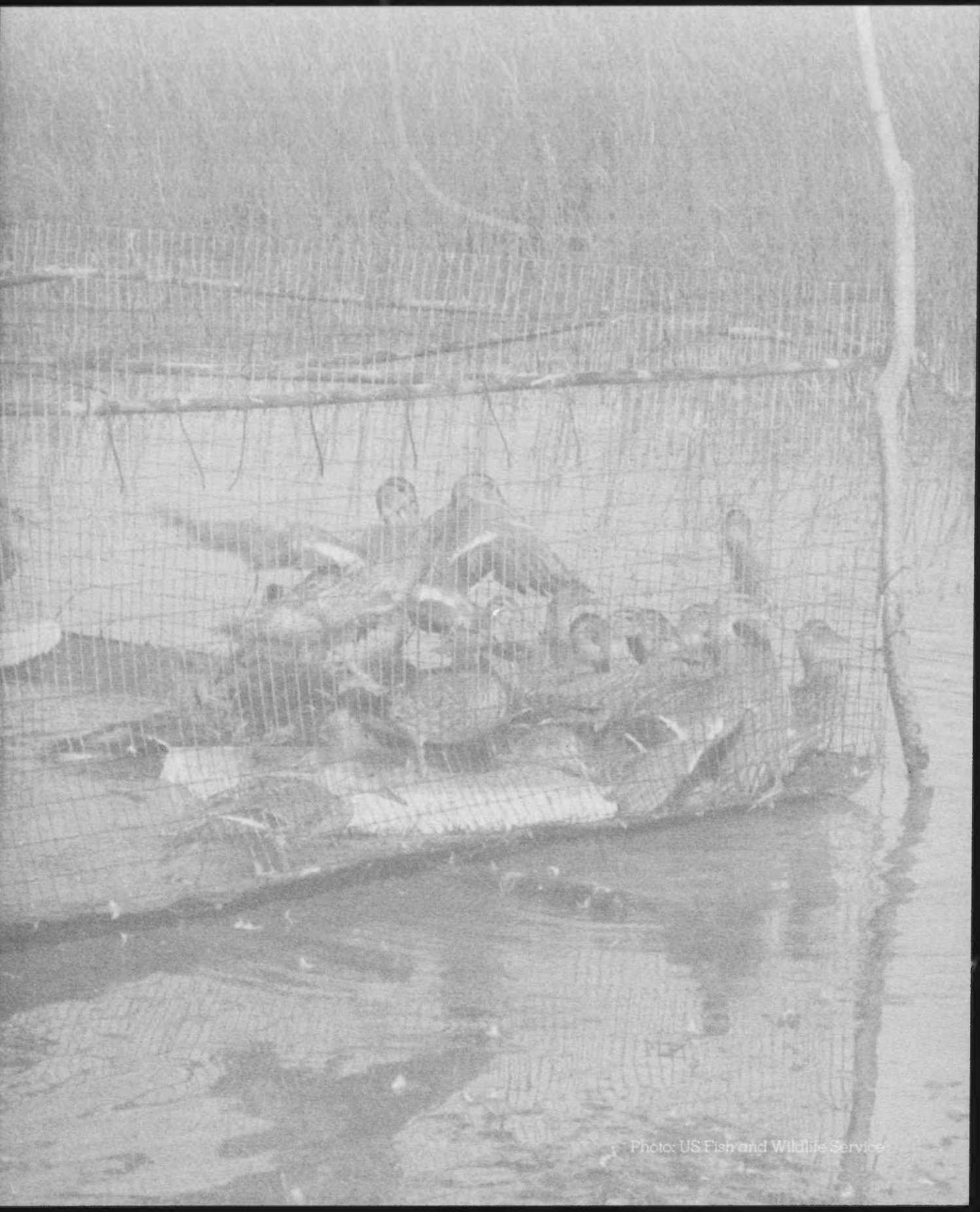
Photo: US Fish and Wildlife Service

Whooping Crane Ecology and Rehabilitation

Period: May 1, 2010 to October 31, 2010

Main Investigator: Lea Craig-Moore, Canadian Wildlife Service

Wildlife Research Permit Number: WL004807

LOCATION:

The project took place within a 200 km radius circle centered on Latitude 60° 10' Longitude 113° 20'.

Most whooping cranes breed within Wood Buffalo National Park (WBNP), however, there are several nests north of the Nyarling River outside the northern park boundary and two nests in Lobstick marsh which is just east of the Little Buffalo River, east of the park boundary.

RATIONALE:

Whooping cranes were listed as an endangered species under the *Species At Risk Act* (SARA) 2004. Since 1966, the Canadian Wildlife Service (CWS) and United States Fish and Wildlife Service (USFWS) have increased management efforts for whooping cranes resulting in a population increase from a low of 21 birds in 1941, to the current population of 270 in the wild in Canada in 2008. In addition, surplus eggs were collected in WBNP to establish a captive population which now numbers 151, and additional wild populations have been established from both captive and wild produced eggs that number an additional 119 birds. Additional management activities are expected to further increase the wild population.

OBJECTIVES:

There were four key objectives to this project:

Breeding pair surveys: To provide an accurate count of breeding pairs in the population which can be used to gauge the health and well-being of this flock.

Hatching success surveys: To provide an accurate count of chick production (not carried out in 2010).

Capture and banding of pre-fledged chicks: Intended to answer questions regarding whooping crane migratory ecology and behaviour during migration using GPS. Specifically intended to answer questions regarding: a) stopover areas, habitat use patterns, and factors influencing habitat use at different spatial and temporal scales, b) how the current migratory route compares to previous route models, and to determine environmental and anthropogenic factors that may influence migratory behavior, and c) to identify causes, locations, and conditions of actual or potential mortality.

Fledging success surveys: This survey tells us two things; firstly, the mortality between hatch and fledging and secondly, the number of family groups expected on the migration route and arriving in the Aransas National Wildlife Refuge complex in Texas.

METHODS:

Aerial surveys over the whooping crane summer range in and around Wood Buffalo National Park (WBNP), NWT. Breeding pair surveys May 1-30, hatching success surveys June 5-20, and pre-fledge chick capture and chick survival surveys August 1-25. Since 1965 the population has grown from 44 individuals to 253.

Breeding pair counts by fixed-wing aircraft and / or helicopter between May 1-30 of each year:

- plot locations on aerial photographs
- record GPS coordinates for nests
- record band colours
- determine egg laying dates and clutch size

Fixed-wing aircraft surveys in June and August to determine hatching success, chick survival and to locate non-breeding cranes and pioneering nesting pairs:

- plot locations on aerial photographs
- record GPS coordinates
- record band colours

Photo: Environment Canada

Rotary wing aircraft surveys in August were used to capture and band pre-fledge chicks. We will trap hatch-year birds before fledgling age with the use of a helicopter. From 1977-1988, CWS banded 134 juveniles in WBNP and we plan to capture birds using the same techniques. The capture crew will consist of three personnel; a veterinarian, handler, and bander. The whooping crane will be cornered and either hand-grabbed or a long-handled net will be placed over the bird to subdue it. The handler will control the crane while the veterinarian and bander collect samples, take measurements, and attach leg bands. We will attempt to capture up to ten cranes per year on the breeding grounds to attach GPS Platform Transmitter Terminals (PTTs), a federal leg band, and a unique combination of coloured leg bands.

RESULTS AND MAIN CONCLUSIONS:

The 2010 whooping crane nesting season was a great success; water levels in spring and late summer were excellent and chicks benefited from mild summer conditions. A record number of nests were found in May; it was the second highest number of pre-fledged chicks and sets of twins recorded in August. For the first time since 1988, chicks were captured and banded in WBNP.

Seventeen hours of whooping crane breeding pair surveys were carried out by the CWS between May 16 and May 21. These aerial surveys were conducted in Cessna 185 aircraft, owned by Northwestern Air Lease of Fort Smith and piloted by B. Campbell. Lea Craig-Moore (CWS) directed the surveys. Kathy St. Laurent (CWS) and Lea Craig-Moore conducted the observations. During the surveys, 74 whooping crane nests were discovered. This is the highest number of nests on record and likely attributable to a pulse of new birds hatched three to five years ago entering the breeding population. An additional ten territorial pairs were also found in the breeding marshes indicating a healthy breeding population and a significant potential expansion in coming years. Territories north of the park in the Nyarling area that were vacant in 2009, the year after a 21% reduction in population due to winter mortality, were once again occupied with breeding or territorial pairs. A new breeding pair was found outside of the park on Salt River First Nation's (SRFN) land in the sedge meadows east of Lobstick marsh. This is the third nest on SFRN land. A total of six nests were therefore found outside the park boundaries.

Due to reductions in the regional whooping crane budget, we were not able to determine clutch size.

There were no June chick surveys flown to inventory hatched young this year.

On August 2, Lea Craig-Moore and Felipe Chavez-Ramirez flew for 5.4 hours in the C-185 to locate family groups suitable for capture. It was decided that families with twins were not eligible for capture because it would be too great a disturbance to the family group, splitting up both young and parents. Nineteen attempts were needed to capture nine chicks on August 2 and 3. The ground capture crew consisted of Felipe Chavez-Ramirez and Jessica Rempel from the Crane Trust, Barry Hartup (DVM) from the International Crane Foundation and Rhona Kindopp from Parks Canada, with Lea Craig-Moore from CWS guiding the activities from the helicopter. Kim Hornsby from Thebacha Helicopters was our pilot. A total of 10.5 hours were spent in the helicopter.

Once families were located, the helicopter circled and found a suitable landing spot where the ground crew was dropped off (typically 200-300 meters from the family group). The helicopter then hovered and positioned so that the family was between the ground crew and it, giving the ground crew an aerial target to walk towards in the dense, high vegetation. Families did not appear stressed from the presence of the helicopter and walked slowly away from it, stopping to preen or feed. Chicks appeared to have one of two responses to the ground disturbance; they made their way to cover or they fled and were impossible to round up and capture.

Blood, feather and cloacal swab samples were taken from all chicks but no feces was collected as the birds did not defecate. The average weight of the 9 chicks was 4800 g and the PTT and color leg bands averaged 2.075 % of the chicks' body weight, well within the limits outlined by the bird banding lab.

Whooping crane fledging success surveys were carried out by CWS from August 9 to August 11. A total of 46 young were discovered in 36 family groups (i.e. 5 sets of twins). This is the second highest chick production and the second highest number of August twins on record.

LONG-TERM PLANS AND RECOMMENDATIONS:

It is very rare in wildlife ecology to be able to monitor an entire population and track individuals for extended periods of time. The small size of the Wood Buffalo-Aransas whooping crane population, the birds' size and colour, and their high degree of territoriality, has made it possible to monitor whooping cranes with great detail, paying attention to population and individual attributes. This long-term data has provided incredible insight to the populations' growth, obstacles and path to recovery.

Despite a healthy average annual growth rate of 4%, reaching the recovery goal of 1000 birds in the wild is many years away. The long-term plans for this project are to continue monitoring breeding effort and chick production. We would like to relate these variables to habitat conditions and quality to better forecast future expansion of the breeding grounds, and future impacts such as global warming and changes in water quality and quantity.

As of 2010, work with partners in the United States to band juvenile and adult whooping cranes with satellite GPS transmitters has begun. The objectives of the project are to determine causes of mortality on migration, which is known to be the most vulnerable yet poorly understood portion of the whooping cranes' life cycle. Additional information such as territory size, habitat use, nesting chronology, movement patterns, and breeding effort can also be gained from the satellite data gathered.

PARTNERS:

Crane Trust
International Crane Foundation
Parks Canada
United States Fish and Wildlife

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Peregrine Falcon Survey Along the Mackenzie River

Period: July 2010

Main Investigators: Suzanne Carrière and Steven Matthews, Environment and Natural Resources, GNWT

Wildlife Research Permit Number: WL005753

Photo: S. Carrière

LOCATION:

Mackenzie Valley – between Norman Wells and Inuvik.

OBJECTIVE:

To determine the status of the peregrine falcon along the Mackenzie River, as part of a larger continent-wide survey completed every five years.

METHODS:

Helicopter survey: The helicopter survey was done July 15-19 2010, along the Mackenzie Valley from south of Norman Wells north to Inuvik. Each of the 191 known peregrine falcon nest sites were visited to record reproductive success. Four additional sites were recorded. A Bell 206 Long Ranger helicopter was used, with one spotter at the front and one spotter-note taker at the back.

River survey: A boat survey was conducted in July along the Mackenzie River to detect nests missed during the helicopter survey and provide nest success data. Chicks were banded in nests easily accessible by water. Banding provides valuable data on migration routes and juvenile survival estimates.

The results of this survey are compared to the 1970, 75, 80, 85, 90, 95, 2000, and 2005 data to determine changes in population health among years.

RESULTS AND MAIN CONCLUSIONS:

Occupancy was average (55%). The surveyed portions of the Mackenzie Valley appeared to have reached a maximum occupancy for peregrine falcon territorial pairs in the early 1990s. New sites can be the result of a known single territory being split between two pairs. New sites were also found outside the study area.

LONG-TERM PLANS AND RECOMMENDATIONS:

In 2007, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessed the peregrine falcon as a species of *Special Concern*. The present legal status of the *anatum* subspecies of peregrine falcon is *Threatened* under the federal *Species at Risk Act* (SARA). The species is recovering after a crash in their numbers in the 1960s and 1970s. That crash was caused by eggshell thinning due to DDT, resulting in low reproduction for many years.

Many populations have been increasing since DDT was banned, but some have seen a reduction in productivity. The Mackenzie Valley is home for a significant portion of the North American population of this species.

The long-term plan is to continue participating in the five-year continental survey of peregrine falcon, to provide coordinated monitoring, and to contribute to the draft management plan for the species in Canada. Results from this survey and similar raptor surveys are also used for land use planning and protected area selection. The data from the 2010 peregrine falcon survey was entered in the NWT/Nunavut Raptor Database and will be preserved in ENR's Wildlife Management Information System (WMIS).

PARTNERS:

Environment and Natural Resources
Volunteers

COMMUNITY INVOLVEMENT:

Community members were invited as observers during the helicopter survey but there was no participation in the 2010 survey.

CONTACTS AND PARTICIPANTS:

Suzanne Carrière, Wildlife Biologist, Biodiversity, Environment and Natural Resources
Bird banding permit holder
Member of Peregrine Falcon Recovery Team

Steve Matthews, Habitat/Environmental Assessment Biologist, Environment and Natural Resources
Member of Peregrine Falcon Recovery Team

PROJECT PERSONNEL:

Keith Hodson
RR#1 Site 16, Comp. 10
Telkwa, BC V0J 2X0
Bird banding permit applicant–experienced peregrine falcon bander

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Population Parameters, Movements, Distribution and Habitat Use of the Ahiak and Beverly Barren-ground Caribou Herds

Period: May 2009 to May 2010

Main Investigator: Allicia Kelly, Regional Biologist, Environment and Natural Resources, GNWT, South Slave Region

Wildlife Research Permit Number: WL005618

LOCATION:

Ahiak and Beverly barren-ground caribou ranges includes the communities of Łutselk'e, Fort Resolution and Fort Smith, NWT.

Photo: A. Kelly

RATIONALE:

Calving ground delineation surveys have demonstrated a drastic decline in the Beverly herd since 1994. Surveys of the Ahiak calving ground indicates a decline in the number of calving cows from 2006 to 2008. Monitoring the Beverly and Ahiak caribou herds is important to determine their status.

OBJECTIVES:

To monitor the distribution and movements of collared cows from the Ahiak and Beverly herds to: obtain information on seasonal use patterns, movement rates and migration routes, evaluate the movements of cows in relation to human and natural disturbances, and to aid in surveying population parameters;

To delineate the distribution and relative density of calving caribou on the Beverly and Ahiak calving grounds, and determine the presence / absence of concentrations of calving caribou surrounding the traditional Beverly calving ground;

Photo: A. Kelly

To measure sex ratio over summer calf survival (fall survey);

To measure ten month calf survival (late winter survey);

To examine genetic relationships between barren-ground caribou herds;

To investigate caribou mortalities;

To opportunistically collect and analyze biological specimens;

To compare trends in collected data with earlier collected data; and

To determine seasonal use of habitat by adult cow caribou.

METHODS:

Monitoring occurs through acquisition of collar location data, scheduled surveys and opportunistic monitoring:

- Continue to acquire location data from the satellite collars currently deployed on the Ahiak and Beverly herds;
- Investigate caribou mortalities (collect biological specimens when possible);
- Radio-track collared cows; and
- Collect biological specimens and shed antlers to submit for genetic analysis.

Conduct aerial surveys to delineate Ahiak and Beverly calving grounds, and to determine whether there are any concentrations of calving caribou outside the traditional Beverly calving ground. The calving grounds are in Nunavut but a portion of the survey covering the migration route of Beverly herd to the calving grounds is in the NWT.

For fall sex ratio and ten month calf survival surveys:

- A fixed wing reconnaissance survey may be required for allocation of effort in relation to the distribution and density of caribou observed as well as the location of collared cows.
- A helicopter will be used to position personnel close to groups of caribou. For large groups, caribou will be approached on foot, viewed with a spotting scope and classified as calves, cows and bulls. For smaller groups, caribou will be classified from the aircraft.

RESULTS AND MAIN CONCLUSIONS:

No results and conclusions were submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

No long-term plans and recommendations were submitted.

PARTNERS:

Environment and Natural Resources

CONTACT

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Photo: A. Kelly

Population Monitoring of the South Nahanni and Coal River Caribou Herds

Period: October 2010

Main Investigator: Troy Hegel, Caribou Biologist, Environment Yukon

Wildlife Research Permit Number: WL005759

LOCATION:

The South Nahanni survey took place in the South Nahanni river watershed in the trans-boundary area north of the Cantung mine, in and adjacent to Nahanni National Park Reserve, east of the Flat River. The Coal River survey took place in an area west of the Flat River to the Hyland River, Yukon (YT).

RATIONALE:

The South Nahanni and Coal River mountain caribou herds are both readily accessible, with all-season roads located within their ranges. Previous surveys and counts of the South Nahanni herd suggest that the herd may be heavily harvested, based on lower bull:cow sex ratios. The harvest rate in 2001 was estimated to be between 4-5%, substantially higher than the 2-3% recommended by the *Yukon Woodland Caribou Management Guidelines*. This potentially high harvest level is coupled with recruitment rates that have been lower than average for other mountain caribou herds throughout the Yukon Territory. Given the concern over the population dynamics of the herd, additional yearly monitoring of population parameters is warranted to gain a more complete assessment of the herd's health, compared to what can be inferred from a single year's estimate.

Furthermore, information on the space use of the South Nahanni herd is relatively sparse. The South Nahanni herd is bordered by three other herds: Coal River (south), Finlayson (west), and Redstone (north). Obtaining a better understanding of how the South Nahanni herd uses the landscape will aid management, as more detailed seasonal range delineation will reduce the likelihood that animals from other herds are included in monitoring and/or population estimation activities. Additionally, given the high amount of industrial activity occurring along the YT-NWT border, a more comprehensive understanding of landscape use by this herd may provide information to better mitigate impacts of development. The Coal River herd has been surveyed only three times before (1997, 2008, and 2009), and given the accessibility of this herd to hunters, obtaining more information on its demographic health is also warranted.

OBJECTIVES:

To estimate the composition of the South Nahanni and Coal River mountain caribou herds, specifically recruitment (calf:cow) and sex (bull:cow) ratios; and

To collect spatial information on seasonal distribution patterns of the South Nahanni caribou herd.

METHODS:

For both the South Nahanni and Coal River herds, a helicopter was used to fly at or above treeline, focusing on high plateaus, which are areas known to be used by mountain caribou during the rut. Routes were flown and areas chosen so as to avoid double-counting of animals. When a group was observed, its composition was assessed and animals were classified into one of five categories: calves, adult female, immature male, mature male, or unclassified. All attempts were made to classify each animal in a group. The locations (latitude and longitude) of groups were recorded using a GPS.

Spatial location data from the South Nahanni herd is obtained from satellite collared adult females. Thirty females were collared in 2008 and will be monitored through 2012.

RESULTS AND MAIN CONCLUSIONS:

South Nahanni survey: 385 animals were classified resulting in a calf:cow ratio of 26.1 calves:100 cows, and a sex ratio of 26 bulls:100 cows.

Coal River survey: 207 animals were classified resulting in a calf:cow ratio of 40 calves:100 cows, and a sex ratio of 32.5 bulls:100 cows. Calf recruitment in both herds was greater than in previous years (2008, 2009). This may be due to more favorable weather conditions at calving during the 2010 spring. This increase in recruitment follows a pattern observed in other mountain caribou herds across the Yukon this year.

LONG-TERM PLANS AND RECOMMENDATIONS:

Satellite collars will be monitored during the next two years to provide more precise estimates of seasonal distribution and movement patterns. In 2011, composition surveys will be completed on both the South Nahanni and Coal River herds. This South Nahanni herd size estimate, in conjunction with parameters collected during composition surveys, will be used to assess the sustainability of the harvest at current levels. Given the reduced size of the Coal River survey this year, and in 2009, a more intensive composition survey of the Coal River herd in 2011 may be warranted. Once this long-term project is completed, a detailed report synthesizing all information, including composition surveys, population estimates, and satellite collar information will be prepared.

PARTNERS:

Environment Yukon
Parks Canada (Nahanni National Park Reserve and Park Establishment Branch)
Environment and Natural Resources

COMMUNITY INVOLVEMENT:

Copies of this and all other reports are provided to communities and Boards. Throughout this long-term project, efforts have been made to have community members on survey flights when possible, and to date we have had observers from Tulita, Nahanni Butte, and Watson Lake participate on the surveys.

Photo: K. Russell

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Arctic Island Caribou and Muskox Population Survey

Period: July 2010–August 2010

Main Investigator: Tracy Davison, Regional Biologist, Environment and Natural Resources, Inuvik Region

Wildlife Research Permit Number: WL007412

LOCATION:

Banks Island and Northwest Victoria Island, NWT.

RATIONALE:

Peary caribou are classified as *Endangered* by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), based on overall declines of 72% since 1961. The last population survey on Banks and NW Victoria Island was conducted in 2005. This survey provides population estimates that allow assessment of the status and recovery of the species.

OBJECTIVES:

To obtain estimates of the number of non-calf and calf caribou, and muskox on Banks and NW Victoria Islands; and

To determine population trends of Peary caribou and muskox populations on Banks and NW Victoria Islands.

METHODS:

A strip transect aerial survey was flown using a fixed wing aircraft. Survey lines were spaced 5 km apart. Observers were seated on each side of the aircraft and observations within a 500 m strip on each side of the aircraft were considered on transect. Observations beyond 500 m were considered off transect. Only muskox on transect were noted and classified as adults or calves. Caribou, both on and off transect, were classified as bulls, cows/young bulls, or calves. All wildlife sightings were recorded. Population estimates for each species were calculated using adult observations utilizing the program Ecological Methodology, Version 7.0 using Aerial Survey Method 2.

RESULTS AND MAIN CONCLUSIONS:

Banks Island Results

The Banks Island survey was flown in 126.6 hrs (including ferry flights between the study area and Sachs Harbour/Polar Bear Cabin) between July 17 and July 26, 2010. There were 215 adult caribou (and 70 calves) seen on transect, giving a population estimate of 1,097 ±343 (95% confidence interval) non-calf caribou on Banks Island.

There were a total of 7,185 adult muskox (and 869 calves) observed on transect, yielding a population estimate of 36,676 ±4,031 (95% confidence interval) non-calf muskox on Banks Island. Observations of calves may be biased low.

One grizzly bear, three foxes, 28 adult wolves and six wolf pups were observed during the survey.

NW Victoria Island Results

The NW Victoria Island survey was flown in 78.1 hrs (including ferry flights between the study area and Ulukhaktok) between July 28 and August 15, 2010. The survey was delayed intermittently by weather.

There were 30 adult caribou (and four calves) seen on transect in blocks A and B, yielding a population estimate of 150 ± 104 (95% confidence interval) non-calf caribou for this area. Caribou observed in block C were considered to be of the Dolphin-Union herd based on locations from collared caribou. There were 85 adult and 14 calf caribou seen on transect in block C giving a population estimate of 430 ± 214 (95% confidence interval) non-calf caribou.

There were a total of 2,273 adult muskox (and 31 calves) seen on transect yielding a population estimate of 11,442 ± 1,637 (95% confidence interval) non-calf muskox.

One polar bear, 18 adult wolves and one wolf pup were observed.

LONG-TERM PLANS AND RECOMMENDATIONS:

Status of Peary caribou and muskox on Banks Island and NW Victoria Island will be monitored at regular intervals in the future. There are also plans to survey the other Arctic islands in the NWT (Melville and Prince Patrick).

PARTNERS:

This study was jointly funded by Inuvialuit Wildlife Studies Funds, Parks Canada (Western Arctic Field Unit), Polar Continental Shelf Program and the Department of Environment and Natural Resources (Government of Northwest Territories).

COMMUNITY INVOLVEMENT:

Thanks go to Glenda Carpenter, Jim Wolki, Kim Lucus, Tony Lucas (Sachs Harbour) and Allan Pogotak (Ulukhaktok) for their assistance as observers.

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Muskox observation locations on NW Victoria Island.

Monitoring of the Bathurst and Bluenose East Caribou Herd

Period: March 31, 2010 to April 7, 2010

Main Investigator: Bruno Croft, Manager, Research and Monitoring, Environment and Natural Resources, North Slave Region

Wildlife Research Permit Number: WL005682

LOCATION:

Caribou composition surveys took place 50 km west of Gamètì, in the Gamètì and Wekwètì area, and east of Gordon Lake, NWT.

RATIONALE:

Monitoring and documenting winter calf survival provides a measure of net recruitment of new animals into a caribou herd, and is an important indicator to assess herd status. Surveys are conducted every year in late March and / or early April.

OBJECTIVES:

To determine movement and distribution of caribou; and

To determine spring calf survival.

METHODS:

A preliminary fixed-wing reconnaissance survey is conducted first to determine locations of caribou in relation to collared cows. Once caribou locations are determined, biologists and community observers classify caribou using a spotting scope and / or from the air using powerful image stabilizer binoculars.

RESULTS AND MAIN CONCLUSIONS:

For the Bathurst caribou herd, 3,533 caribou were classified in late winter and the calf:cow ratio was 45 per 100.

For the Bluenose East caribou herd, 6,597 caribou were classified in late winter and the calf:cow ratio was 47 per 100.

LONG-TERM PLANS AND RECOMMENDATIONS:

The late winter and fall composition surveys are two important indicators of population status and will be continued on an annual basis.

PARTNERS:

Tłı̨chǫ Government community participants from Gamètì, Whatì, and Wekwètì.

COMMUNITY INVOLVEMENT:

Information from the communities was used to interpret movements and locate caribou for spring and fall composition counts. Aboriginal hunters were part of the survey teams to help assess overall condition of animals classified.

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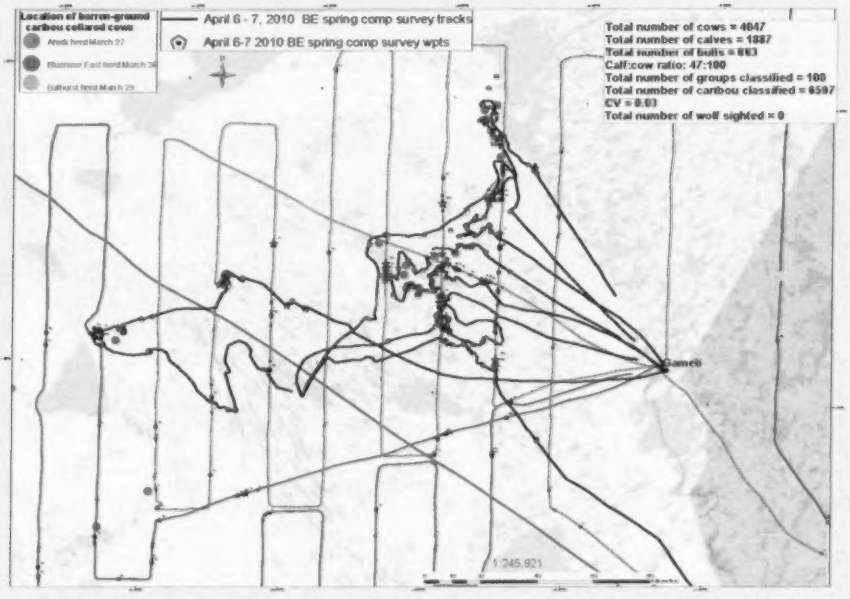
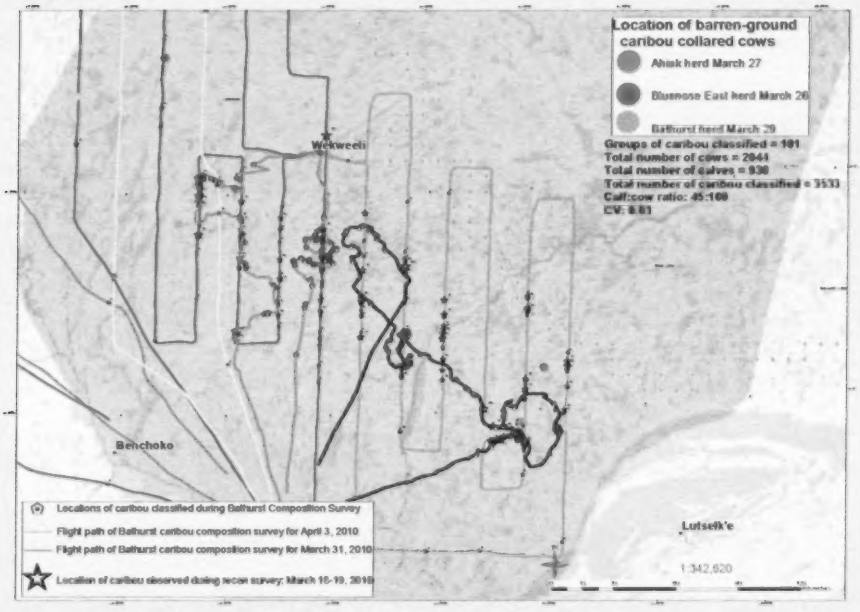

Location of barren-ground caribou collared cows
Ahiak herd March 27
Bluenose East herd March 26
Bathurst herd March 29
April 6 - 7, 2010 BE spring comp survey tracks
April 6-7 2010 BE spring comp survey wpts
Total number of cows = 4047
Total number of calves = 1887
Total number of bulls = 663
Calf:cow ratio: 47:100
Total number of groups classified = 100
Total number of caribou classified = 6597
CV = 0.03
Total number of wolf sighted = 0
Lutselk'e
1:245,921


Location of barren-ground caribou collared cows
Ahiak herd March 27
Bluenose East herd March 26
Bathurst herd March 29
Groups of caribou classified = 101
Total number of cows = 2841
Total number of calves = 930
Total number of caribou classified = 3533
Calf:cow ratio: 45:100
CV: 0.01
Wekweeti
Benchoko
Lutselk'e
Locations of caribou classified during Bathurst Composition Survey
Flight path of Bathurst caribou composition survey for April 3, 2010
Flight path of Bathurst caribou composition survey for March 31, 2010
Location of caribou observed during recon survey: March 16-19, 2010
1:342,820

Bathurst Caribou Health, Condition and Contaminant Monitoring

Period: March, 2010 to April, 2010

Main Investigator: Bruno Croft, Manager, Research and Monitoring, Environment and Natural Resources, North Slave Region

Wildlife Research Permit Number: WL005683

LOCATION:

Two separate sampling collections were conducted during the Tłı̨chǫ and Yellowknife Dene First Nation (YKDFN) limited community hunts.

The Tłı̨chǫ collection took place in mid-April 2010 in the vicinity of Wekwèti, NWT.

The YKDFN collection took place March 27 and 28, 2010 in the vicinity of Brown Lake, NWT.

RATIONALE:

Healthy body condition, and disease and parasite status of barren-ground caribou provide important information on the status of the herds and on the potential for population growth. Samples taken from harvested animals can be checked for environmental contaminants and trends over time.

OBJECTIVES:

To collect information on the health, diseases and parasites of Bathurst caribou to assess current status and monitor trends over time;

To collect information on body condition of caribou on the Bathurst range;

To collect information on the presence of environmental contaminants in caribou, to assess current exposure and trends over time; and

To compare this information to previous information from the Bathurst caribou herd and other caribou herds across the north using a standardized protocol developed by the Circum Arctic Rangifer Monitoring & Assessment Network (CARMA) and previous collections by Environment and Natural Resources.

METHODS:

Health, condition and contaminant sampling was conducted on caribou harvested by community hunters on the Bathurst caribou range in late winter of 2010. A field camp was established based on the location and distribution of caribou, determined by location of collars and advice from the communities. Local hunters harvested and butchered the caribou, and sampling was conducted on each animal.

Information requested and collected consisted of the following:

- Date and location of harvest
- Sex
- Field age estimate
- Pregnancy status
- Field condition assessment
- Back fat measurement

Record of any diseases or abnormalities

Any other observations

Lower jaw collection with the incisor teeth for aging

Kidney (one per animal) collection for condition and contaminant analysis

RESULTS AND MAIN CONCLUSIONS:

Tłı̨chǫ collection (13 females and 7 males)

Estimate of age:

19 adults (3 young adults, 13 moderate adults, 3 old adults)

1 yearling

Hunter scores of condition of bathurst caribou:

Skinny: 6 of 20 caribou

Skinny to not bad: 3 of 20 caribou

Not bad: 11 of 20 caribou

Fat: none

Very fat: none

Back fat measurements April 2010:

Both sexes – mean 1.29 mm (range 0-4 mm) – 14 caribou measured

Females – mean 1.0 mm (range 0-3 mm) – 8 cows

Kidney fat index April 2010 (Wekweètì collection):

Both sexes (20 samples): mean 39.1% (range 14.05% to 73%)

Females (12 samples): mean 40.4% (range 23% to 73%)

Pregnancy April 2010:

70% in adult cows (7/10)

Hunters did not report any obvious signs of disease, parasites or injuries other than warble flies.

YKDFN collection (22 females and 23 males)

Back fat measurements March 2010:

61% in adult cows (11/18)

Hunters did not report any obvious signs of disease, parasites or injures other than warble flies.

LONG-TERM PLANS AND RECOMMENDATIONS:

These initiatives are part of the monitoring actions identified in the Bathurst Caribou Management Plan (2004) and the long term objective is to continue to assess health and condition of caribou using a less detailed sampling protocol that can be carried out at the community level.

PARTNERS:

Tłı̨chǫ Government
The community of Wekweètì (spring hunt)
YKDFN (N'Dilo and Dettah)

COMMUNITY INVOLVEMENT:

Information from communities was used to help select a site where caribou will be collected. We worked with hunters in the field to discuss the health and condition of caribou that were collected and tested.

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Photo: R. Mulders

Speciation and Concentration of Arsenic in Hare Inhabiting the North Slave Region

Period: June 6, 2010 to June 27, 2010

Main investigator: Kenneth J. Reimer, Professor, Royal Military College of Kingston

Wildlife Research Permit Number: WL005691

Photo: J. Dee

LOCATION:

The study was conducted at both the Giant mine and Con mine sites, and also a background site next to the Ingraham trail, about 10 km northeast of Yellowknife that was found to be uncontaminated.

RATIONALE:

The overall goal of this project is to study animals used for human consumption, specifically to determine if the animals are accumulating arsenic that they are exposed to, and if the animals are transforming or selectively retaining this arsenic. Through previously studied hare, we have found non-toxic forms of arsenic. We hypothesized hare are eating arsenic via mushrooms, which also contain the non-toxic species. We hypothesized that when these food sources (mushrooms) are not available to the hare (as was the case during our sampling period), their overall body burdens of arsenic will be lower and more typical forms of arsenic (methylated species, also relatively non-toxic) will be present.

OBJECTIVES:

To obtain information on arsenic forms and concentrations in hare, in the same manner as that used by hunters to obtain game;

To determine any differences between arsenic concentrations and arsenic species in hare inhabiting contaminated versus uncontaminated sites;

To determine sources of arsenic, specifically arsenic in food, for hares; and

To determine the bioaccessibility (amount that is soluble in the gastrointestinal system and available for uptake into organisms) of the arsenic compounds in the hare muscle tissue.

METHODS:

Snowshoe hares were caught using snaring methods used by local experts during the trapping season. The study methods were consistent with guidelines on the care and use of wildlife recommended by the Canadian Council on Animal Care. We aimed to collect a maximum of 20 snowshoe hares: 10 from the selected contaminated area and 10 from the background area. Snares were set at several locations. Five hares in total were snared at three of locations: three from the Con mine site, one from the Giant mine property and one from a background site along the Ingraham Trail, approximately ten kilometres outside of Yellowknife. All snares were set for the full three weeks of the study and checked daily. No by-catch was obtained during our sampling trip.

Plants, as well as soil samples were collected at all of the successful hare snaring locations.

Hares were dissected and frozen on dry ice in Yellowknife until analysis. Plants were kept cool after sampling until they could be washed thoroughly with water and rinsed with dionized distilled water in Yellowknife. Plant parts were separated and frozen. All samples were shipped frozen to RMC in Kingston, ON.

Hare tissues were homogenized and freeze dried prior to extraction. A subsample of the freeze dried tissue was weighed and extracted via an end-over-end shaker with a 1:1 methanol water extraction solvent. Methanol was then evaporated from the extracts, which were filtered and weighed. The speciation analysis was carried out via high performance liquid chromatography–inductively coupled plasma mass spectrometry (HPLC-ICPMS) and the instrument results were integrated using PeakFit software to determine peak areas. Total arsenic in tissues was measured by ICPMS following nitric acid digestion. Plants will be analyzed using similar methods.

Bioaccessibility extractions are underway to estimate the arsenic in hares that is soluble in the gastrointestinal tract and thus available for uptake into humans ingesting the hares. The bioaccessibility extraction method is known as the physiologically-based extraction method (PBET) and consists of mixing the hare muscle samples in an amount of gastric fluid representative of food consumption (10:1 liquid to fresh weight solid). The gastric fluid consists of a mixture of low molecular weight organic acids, pepsin, and HCl at a pH of 1.8. After one hour of mixing, at body temperature (37° C), the mixture is adjusted to intestinal conditions (pH 7, bile and pancreatin added), and the extraction proceeds for another four hours. Extracts obtained after one hour and five hours are analyzed for total arsenic and arsenic species.

RESULTS AND MAIN CONCLUSIONS:

The concentration of total arsenic in muscle tissue in hare from contaminated sites (430-1720 µg/kg wet weight, or part per billion (ppb) ranged from 6.2-25 times the concentration of total arsenic of the hare captured at the background site (69 µg/kg wet weight). Non-toxic arsenobetaine (AsB) was not found in any of the hares analysed. This is significant because it confirms our hypothesis that hares obtain arsenobetaine via food, since our hypothesized source of arsenobetaine, mushrooms, were out of season in June 2010. The major arsenic species identified in the hare tissue analyzed thus far (muscle, kidney and liver) is the relatively non toxic arsenical dimethylarsinous acid and the minor arsenic species identified in the hare tissues are monomethylarsonous acid, arsenite, arsenocholine and trimethylarsine oxide. The extraction efficiencies range from approximately 58-70%; therefore 30-40% of the arsenic species in each sample is unidentified. We will attempt to identify these unextracted species using synchrotron radiation in June 2011, when we travel to the Canadian Light Source (CLS) in Saskatoon, SK.

Stomach contents and hare dietary items (plants) will be analyzed for total arsenic and arsenic species in May-June 2011 and bioaccessibility extractions are currently being conducted (May 2011).

Our plans are to publish two papers from this project: one relating the arsenic species found in the hare tissues to the hare diet and the other reporting the bioaccessibility of arsenic compounds in the hare tissue studied in this project. The bioaccessibility results will be added to a database being collected by Stantec for their use for risk assessment purposes so they can extrapolate results from the Yellowknife hare to future projects involving country food consumption and associated risk. All results will be compiled in an M.Sc. thesis, anticipated to be completed by December 2011 and available for distribution after that date.

LONG-TERM PLANS AND RECOMMENDATIONS:

To obtain more data on fall-collected hares, a future trip to sample in September, when mushrooms are growing, would be desirable. No plans have been made for such a trip in 2011. Monitoring of arsenic concentrations and species in Yellowknife hare over several years, from different locations and at different times of the years would be interesting.

PARTNERS:

Deton'Cho / Nuna Joint Venture (Mike Borden) for access to Giant Mine site
Environment and Natural Resources (Brett Elkin and Dean Cluff) for laboratory access in Yellowknife
Stantec (Chris Ollson)

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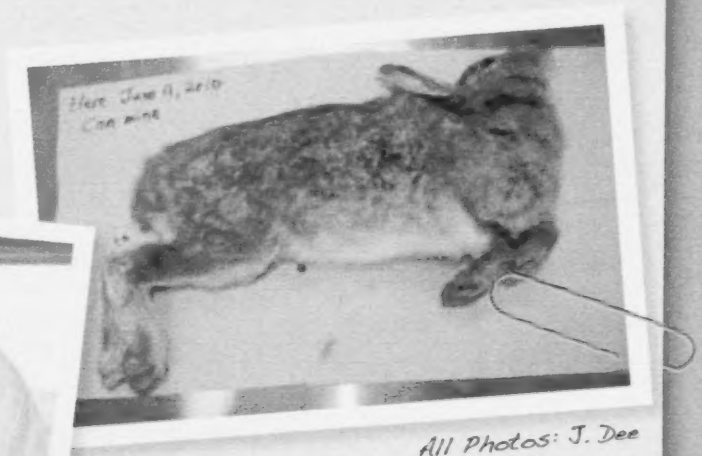

All Photos: J. Dee

Comparative Study of North and South Slave Marten

Period: January 2010 to April 2010

Main investigator: Adrian Lizotte, Student, Environment and Natural Resource Technology Program

Wildlife Research Permit Number: WL005624

LOCATION:

Research was conducted in Fort Smith, NWT, as part of the technical project required under the Environmental and Natural Resources Technology Program (ENRTP). Carcass samples were collected 20 miles southwest of Fort Smith from traditional trappers and the Bliss Lake Trapper Training Program in the Yellowknife area.

RATIONALE:

As marten pelts are the most economically important furbearer of the Northwest Territories, the study was initiated to determine whether there is a significant economical difference between the North and South Great Slave Lake Regions.

OBJECTIVES:

To compare the population and physical characteristics between marten in the North and South Slave Regions, and determine any significance.

METHODS:

Fourteen marten carcasses were collected from the North Slave area and nine carcasses were collected from various trappers in the South Slave area. The laboratory research included necropsies on all carcasses and measurements of total length, tail length, skull length and width, width of temporal muscle gap, omental fat weight, stomach content weight and total weight. Adult male to female ratio and juvenile to adult ratio were also compared.

RESULTS AND MAIN CONCLUSIONS:

Carcass weights, lengths and widths were compared by applying the (statistically based) 'T' test. The results indicated that there was not a significant difference in size from one region to another. The x^2 (Yates) formula was applied to determine if there is a significant difference in population. Although sample sizes were limited, These reslts showed no signifiant difference between the North and South Slave marten populations.

LONG-TERM PLANS AND RECOMMENDATIONS:

As no significant difference exists between the North and South Slave Regions, Environment and Natural Resources (ENR) Wildlife Division can effectively apply one management regime to both regions. Differences between the North and South Slave Regions and other regions of the NWT would provide a more complete picture of the marten population throughout the NWT. The *Take a Kid Trapping Program* could be used as a method to collect and analyze this data throughout regions. Additionally, as marten and other small fur bearers are great animals to promote youth to trap, ENR could engage youth as wildlife monitors in a much more meaningful way. For example, through the *Take a Kid Trapping Programming*, youth could learn not only how to trap and skin animals, but also how to make scientific observations and analysis in a capacity which would be useful for wildlife management records.

If any historical records can be retrieved to determine whether the marten population today represents an increase or decrease in its original population size this would inform management strategies.

Lastly, through Aurora College's technology project requirement in ENRTP, it might be useful for ENR Wildlife Division to provide a list of useful project ideas to the college to engage students in meaningful research and provide a forum for ENR to obtain useful wildlife information.

PARTNERS:

Kevin Antoniak, Senior Instructor with Aurora College
ENRTP provided support and guidance to this research project
Alicia Kelly-South Slave Regional Biologist provided lab support during necropsies

COMMUNITY INVOLVEMENT:

The following groups were notified by email, phone and fax regarding the research study: Fort Smith Métis, Salt River First Nation, Smith Landing First Nation, Yellowknife Dene First Nation, and North Slave Métis Alliance. There was no interest from any of these stakeholders to be directly involved in the study.

CONTACT:

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Muskox Abundance and Distribution Survey

Period: March 15, 2010 to March 31, 2010

Main Investigator: Dean Cluff, Regional Biologist, Environment and Natural Resources, GNWT, North Slave Region

Wildlife Research Permit Number: WL00005681

LOCATION:

59,000 km^2 of land located near Łutselk'e, NWT was flown over a six day period.

RATIONALE:

Muskox have been increasing in abundance and range since unregulated muskox hunting was banned in 1917 and the Thelon Game Sanctuary established in 1927.

Observations of muskox since 1998 suggest that muskoxen have continued to re-colonize their former range and expand somewhat into the trees. The subsequent decline in barren-ground caribou and the reduction or closures in hunting caribou, have spurred interest in harvesting alternate country food sources, including muskoxen. Consequently, a muskox survey is needed to estimate the current population range and abundance in the North Slave Region and estimate a sustainable harvest quota. Since 2008, Łutselk'e and the surrounding area east to the Nunavut boundary has become part of the North Slave Region.

OBJECTIVE:

To estimate the number and distribution of muskox in the North Slave Region.

METHODS:

Muskox range and abundance will be estimated by a stratified aerial survey conducted in mid to late March 2010. Aircraft used will be a Found Bush Hawk, operated by Hoarfrost River Huskies. Strata will be similar to those established in the 1998 survey, although the study area may expand slightly to the west to accommodate recent range expansion. Strata assigned will be based on previous observations, tree areas and river drainages on the tundra. Final study area boundaries will be established in February after consultation with the Łutselk'e community members.

Transect width will be two kilometers (one kilometer on each side of the aircraft) except below the treeline, where transect width will be one kilometer (500 m on each side of the aircraft). Five zones (four within transect, one off transect) will be marked across the survey windows to help determine distance from the plane that the observation is made. Perpendicular distance from the transect center line is needed to estimate detection probability. Animals closer to the plane and those in large group sizes have a greater probability of being detected by observers and this can be modeled (Buckland *et al.* 2001). Sightings of animals will be recorded by waypoints along transect at first discovery and its position within the transect zones noted. For muskox, the aircraft will circle the individual or group once to take a GPS waypoint of the location for a more precise distance from the transect center line. Muskox tend to form larger group sizes in winter than in summer and can be difficult to count from a distance. Therefore, while a waypoint is taken of the group's location, an accurate count of group size will also be obtained. A picture will be taken of each group at the same time to allow a precise count of all muskox and possibly distinguish calves to determine calf recruitment. The aircraft will then return directly to the transect line and resume flying the survey transect line. Data analysis will be done with program Distance (Thomas *et al.* 2009).

RESULTS AND MAIN CONCLUSIONS:

We observed 358 muskoxen within the treeline. The muskox were very clumped in distribution and found at a low density. We had reasonable coverage at 30%, initial random selection of line placement, good survey weather, visibility and observers. We didn't see many calves.

Border A licence area was not covered as there was not enough time to complete a survey this year.

LONG-TERM PLANS AND RECOMMENDATIONS:

A muskox survey for Border A licence area year next year with closer survey lines in the trees is being planned. Some overlap with the Łutselk'e area might be considered too, as our ability to sight in the treed area doesn't extend as far from the plane as it does on the tundra.

Data entry and analysis of results is on-going.

PARTNERS:

Environment and Natural Resources

COMMUNITY INVOLVEMENT:

Pete Enzoe, Łutselk'e

Herman Catholique, Łutselk'e

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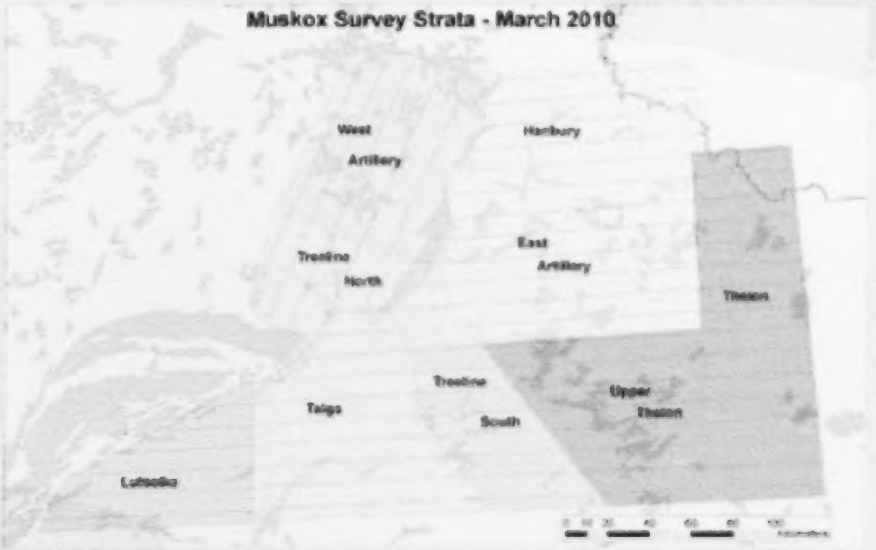

Dall's Sheep Aerial Survey in the Richardson Mountains

Period: June 2009

Main Investigator: Kyle Russell, Wildlife Technician, Yukon Territorial Government; Kristen Callaghan, Wildlife Biologist, Gwich'in Renewable Resources Board

Wildlife Research Permit Number: WL007416

LOCATION:

Richardson Mountains, NWT.

RATIONALE:

The Dall's sheep population in the Richardson Mountains is relatively small and isolated at the northern end of the species range. It has a high cultural and traditional value for northern people, and a number of sheep are harvested each year by Gwich'in and Inuvialuit in the NWT. There are also local reports of a limited sheep harvest by Vuntut Gwitchin from Old Crow, Yukon.

The Government of the Northwest Territories (GNWT) and the Yukon Territorial Government (YTG) have been monitoring the Dall's sheep population in the Richardson Mountains since 1984. The overall population has varied from 802 in 1986 to 1573 in 1997 to the latest estimate of 704 in 2006. Since 1997, the population has declined.

OBJECTIVES:

To obtain estimates of recruitment rate; and

To estimate population abundance and sex/age structure.

METHODS:

The northern Richardson Mountains (67° 30'–68° 30' N, 135° 30'–137° W) were surveyed in late June 2010 with a helicopter to locate and classify sheep. Contours and drainages were flown in survey blocks. One trained biologist was on each side of the aircraft to spot and classify the sheep. One community assistant was hired. Sheep will be classified as ewes, lambs, ½ curl, ¾ curl, and full curl rams.

RESULTS AND MAIN CONCLUSIONS:

Survey blocks were successfully flown this year, though there were some setbacks. The survey began in good weather on June 22 and the first two days of flying went well. On June 24, an incoming system of low cloud and sporadic rain showers forced the crew to abandon the survey of Bell block when it was only half completed. Weather conditions overall were poor thereafter, only permitting survey flights on July 5 and 6 with survey completion on July 9. The entirety of Bell block was reflown July 9 replacing the sheep observations made during the interrupted survey of that block on June 24.

In total 700 sheep were observed, of this 549 were adult sheep, 150 were lambs and one sheep was unclassified. Of the adult sheep, 384 were nursery and 165 were rams.

LONG-TERM PLANS AND RECOMMENDATIONS:

The current population size of 549 adults is sufficiently large that a re-assessment of management practices will not be triggered. The population has steadily declined since an observed peak in 1991, though the current population is only negligibly smaller than that of 2003 and 2006. (The 2003 survey estimated 606 adults; the 2006 survey estimated the adult population at 561.)

The population will continue to be monitored with population surveys every 3-5 years.

PARTNERS:

Gwich'in Renewable Resources Board
Government of the Northwest Territories
Yukon Territorial Government

COMMUNITY INVOLVEMENT:

Dale Semple of Aklavik, NWT assisted with the survey.

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Photo: K. Callaghan

Wolverine DNA Sampling on the Central Barrens

Period: January 2010 to December 2010

Main Investigator: Robert Mulders, Wildlife Biologist (Carnivore and Furbearers), Environment and Natural Resources, GNWT

Wildlife Research Permit: WL005686

LOCATION:

Areas surrounding Daring Lake, Ekati Diamond Mine, Diavik Diamond Mine and Kennady Lake Mine

RATIONALE:

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has identified wolverine as a conservation concern. On the central barrens, activities relating to mining exploration and sport hunting have increased. Agencies governing activities and wildlife monitoring have expressed concerns over the adverse cumulative effects on wolverine populations, habitat loss, disturbance and increasing mortality.

OBJECTIVES:

To determine wolverine abundance and density estimates at Daring Lake using a standard hair snagging sampling design; and

To obtain demographic data to monitor long-term changes in the wolverine populations.

RESULTS AND MAIN CONCLUSIONS:

Wolverine hair snagging was completed in April 2010 within the BHP Diamond Mine, Diavik Diamond Mine and Daring Lake regional study areas. Wolverine hair samples were recently submitted to a genetics laboratory in British Columbia, with analysis expected to be completed by late October 2011.

LONG-TERM PLANS AND RECOMMENDATIONS:

Genetic results will then be further analyzed in the fall to review optimum cell size, and to review options for modifying the current survey interval of every second year. For example, options and trade-offs of increasing the cell size, and possibly extending the DNA survey interval to every three years will be considered. It's expected that this hair snagging protocol will continue to provide a rigorous and useful survey technique for monitoring relative wolverine abundance on the central barrens.

PARTNERS:

Environment and Natural Resources
Yellowknives' Dene First Nation
Integrated Ecological Research (John Boulanger)
Wildlife Genetics International (Dr. David Paetkau)

CONTACT:

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NWT Wolverine Carcass Collection

Period: January 2010 to December 2010

Main Investigator: Robert Mulders, Wildlife Biologist (Carnivore and Furbearers), Environment and Natural Resources, GNWT

Wildlife Research Permit Number: WL005625

LOCATION:

All NWT regions (Inuvik region is covered under a separate WRP).

RATIONALE:

In the Inuvik, Sahtu and North Slave Regions, there is increasing interest in providing opportunities for non-resident and non-resident alien hunters to participate in guided wolverine hunts. To determine if an increased harvest is sustainable, we require a better understanding of the current level, distribution and composition of wolverines being harvested. To do this, ENR is conducting a multi-year wolverine carcass collection. This effort will provide information on the age, sex, body condition, reproductive parameters and seasonal diet of the animals harvested. This data is needed to address a range of management issues facing this species.

OBJECTIVES:

To document the level and pattern of wolverine harvest in the NWT;

To assess the age, sex ratios, condition, seasonal diet and reproductive parameters of the wolverines harvested across the NWT; and

To use genetic material to compare wolverine populations across the NWT and to complement DNA hair-snagging efforts.

METHODS:

Environment and Natural Resources (ENR) is conducting an NWT-wide wolverine carcass collection. All hunters in the NWT are encouraged to participate ,and are offered financial compensation to bring in each complete skinned-out carcass and provide information on harvest date and location. This initiative will involve close collaboration with regional staff in terms of administering payment to hunters and in using a standardized necropsy protocol:

Whole wolverine carcasses will be weighed and measured;

Tooth removal for age analysis;

Skulls removed, cleaned and measured;

Stomach contents collected for diet analysis;

Intestines to be examined for parasites;

Body condition to be assessed;

Females reproductive tracts examined; and

Tissues collected for genetic analysis.

RESULTS AND MAIN CONCLUSIONS:

One Hundred and ten wolverine carcasses were sampled from the Sahtu, Dehcho, South Slave and North Slave regions. This sample size is down from 130 examined last year. Tissue analysis (i.e. tooth aging and analysis of stomach contents) will be carried out in the months ahead and a comprehensive analysis of the necropsy data will be conducted in late 2011.

LONG TERM PLANS AND RECOMMENDATIONS:

ENR will not be collecting wolverine carcasses from hunters and trappers in the Sahtu, Dehcho, South Slave and North Slave regions during the next two seasons (2011/12 and 2012/13). This collection will be suspended until analysis of this multi-year dataset is completed. This data will provide useful information required in drafting a *Wolverine Management Plan for the NWT*. It's anticipated that the wolverine carcass collection will resume in 2013/14.

CONTACT:

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Wildlife Health & Genetic Monitoring

Period: January 1, 2010 to December 31, 2010

Main Investigator: Brett Elkin, Disease and Contaminant Specialist, Environment and Natural Resources, GNWT

Wildlife Research Permit Number: WL005622

LOCATION:

NWT-wide.

RATIONALE:

Although most wild animals are healthy, diseases and parasites do occur in any wildlife population. Some diseases and parasites are naturally occurring and appear to cause little problem in their host, while others have the potential to impact wildlife at both the individual animal and population level. Some of these diseases and parasites can also affect people and domestic animals.

Samples from animals harvested by hunters and trappers, found dead, or handled during wildlife research or management activities by ENR staff, other wildlife agencies or university researchers can provide valuable health, condition and genetic information on wildlife populations. These samples provide an opportunity to monitor diseases and contaminants of particular importance to wildlife and human health, and to identify new and emerging diseases. Taking advantage of samples from these existing activities provides additional valuable information for making wildlife management decisions and providing public information.

OBJECTIVES:

To determine the cause of sick or dead wildlife found, harvested or handled by hunters, trappers, biologists, wildlife researchers, Renewable Resource Officers, or the general public;

To assist hunters and trappers by testing samples from harvested wildlife to determine what diseases or parasites are present, and the implications for consumption of the carcass;

To work co-operatively with hunters, trappers, biologists, Renewable Resource Officers and members of the general public to monitor the occurrence of diseases and parasites in wildlife on an ongoing basis;

To identify the types, relative levels and geographical distribution of diseases, parasites and abnormalities found in wildlife across the Northwest Territories;

To increase community awareness of diseases and parasites; and

To collect genetic information that will contribute to the understanding and management of wildlife populations.

METHODS:

Samples are collected in several different ways.

Local hunters, trappers and Renewable Resource Officers frequently submit samples from harvested wildlife. They generally provide detailed information on the animal and the particular case, and often provide additional information on the occurrence and patterns of similar cases within their harvest areas.

Members of the general public, wildlife biologists or Renewable Resource Officers may also submit samples from wildlife that are sick or found dead.

Samples from animals handled during wildlife research or management activities by biologists,

technicians, other wildlife researchers, or Renewable Resource Officers are also submitted for disease testing. Samples of the affected tissues or body parts are collected, as well as other samples necessary to determine health status, body condition and age.

Samples are analysed for diseases, parasites, condition and/or genetics. In many cases, this requires the shipment of samples to specialized laboratories to determine the cause of the abnormality. Results of the testing are provided to the individual(s) who submitted the sample, and recorded in an NWT disease database to monitor disease trends across the NWT and over time.

RESULTS AND MAIN CONCLUSIONS:

Hunter submitted samples in 2010 (lab tested).

Samples submitted for disease surveillance:

Anthrax surveillance in Mackenzie Bison Sanctuary & Slave River Lowland June through August

Anthrax emergency response to two outbreaks

Slave River Lowlands in July (45 bison mortalities)

Mackenzie Herd in August (10 bison mortalities)

Barren-ground caribou health and condition surveillance: Ahiak, Bathurst & Bluenose East herds (230 tested)

Brucellosis & TB surveillance in wood bison

- Intensive health assessment (13 bison)
- Hunter collected samples (~ 25 bison)

Chronic Wasting Disease surveillance: white-tailed deer & caribou sampled

National avian influenza surveillance–birds (not detected)

National west nile virus–birds & mosquitoes (not detected)

Rabies surveillance (57 submissions, 5 positive)

Trichinella surveillance – multiple species

Toxoplasma surveillance – multiple species

Contaminant testing in caribou (20 samples submitted)

Sahtu Community Wildlife Health Monitors

Products produced:

Results reported to individual hunters and trappers.

NWT wildlife disease surveillance & database.

NWT rabies surveillance & database.

Participation in national avian influenza, west nile virus and CWD surveillance programs.

Emergency response & control of 2 anthrax outbreaks.

LONG-TERM PLANS AND RECOMMENDATIONS:

Wildlife disease surveillance is ongoing every year.

Long term testing will continue on any hunter submitted samples, animals found dead, and the investigation of disease cases or outbreaks. Results of this testing will be used to provide information and recommendations to individual harvesters, the public, and wildlife management agencies and wildlife co-management boards.

PARTNERS:

Local hunters and trappers
Members of the general public
Environment and Natural Resources biologists and Renewable Resource Officers
Canadian Cooperative Wildlife Health Centre
Canadian Food Inspection Agency

COMMUNITY INVOLVEMENT:

Hunters and trappers frequently bring in samples or provide reports of diseases, parasites or abnormalities in harvested wildlife. Identification of the diseases or parasites involved in these cases can be important to make decisions on consumption of meat from the affected animal. Sick or dead animals are also found periodically in the wild, and testing is required to determine the cause of death and potential significance for other wildlife and people. Information provided by hunters and trappers on the occurrence of diseases and parasites can also be used to identify areas requiring further monitoring or testing.

Local hunters, trappers and members of the general public are encouraged to submit samples of any abnormalities they find in the wildlife they harvest. Results of testing are provided back to the individuals submitting the samples following diagnostic testing.

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Photo: S. Gunn

Small Mammal and Hare Transect Surveys

Period: June 2010 to September 2010

Main Investigator: Suzanne Carrière, Wildlife Biologist, (Biodiversity) Environment and Natural Resources, GNWT

Wildlife Research Permit Number: WL005758

Photo: D. Allaire

Photo: S. Matthews

LOCATION:

Sahtu	
Norman Wells:	65° 18' N; 127° 20' W
Tulita:*	64° 54' N; 125° 34' W
North Slave	
Yellowknife:	62° 24' N; 114° 26' W
Bliss Lake:*	62° 34' N; 113° 20' W
Gordon Lake:	63° 00' N; 113° 10' W
Daring Lake:	65° 00' N; 111° 30' W
Dehcho	
Fort Liard:*	60° 39' N; 117° 29' W
Fort Simpson:	62° 00' N; 122° 00' W
South Slave	
Fort Smith:	60° 01' N; 111° 54' W
Fort Resolution	61° 10' N; 113° 40' W
Tsu Lake (Aurora College)	60° 35' N; 111° 53' W
Inuvialuit-Gwich'in	
Inuvik:	68° 18' N; 133° 29' W

* Survey not performed in 2010 due to unavailable personnel.

All surveys were done June 1, 2010 to August 31, 2010.

OBJECTIVES:

The NWT small mammal survey (SMS) monitors changes in density of voles, mice, lemmings, and shrews across five ecozones in the territory. The hare transect survey (HTS) monitors snowshoe hare density across all forested ecozones.

METHODS:

Small mammal data is collected using snap-traps or live traps and reported as the number of trapped specimens per 100 trap-nights (capture index). Monitoring is done on standardized permanent trap lines. Usually, 100 traps are out for five nights. Trap lines are checked at least each morning before 10:00 a.m. The trapping is planned for August each year, but at some sites the survey is performed in June, July or September if other activities require a change in timing.

Hare data is collected on four transects at each site. Each transect consists of 20 permanent quadrats measuring 5.1 cm x 305.0 cm oriented along the transect and evenly spaced 15 to 30 m apart. Hare fecal pellets deposited within each quadrat are then counted and cleared from the quadrat. The number of pellets per quadrat is then correlated to an estimate of hare density (number of hare per hectares) at each site.

RESULTS AND MAIN CONCLUSIONS:

In summer 2010, small mammal numbers were average in most sites in the NWT except in Fort Resolution where a record peak occurred.

Peaks in hare numbers occurred in the NWT every 10 years or so, in 1962, 1971, 1980, 1990, and then in 1999-2000. Hare populations across the NWT remained low between 2002-2006, but increased rapidly in 2009 and may have peaked in 2010. This latest peak in numbers is not as high as in previous decades. Lower peaks are also observed in the Yukon.

LONG-TERM PLANS AND RECOMMENDATIONS:

This survey is part of long-term efforts to monitor the natural fluctuations in both forested and tundra ecosystems in the NWT. Plans are to continue the survey and expand the number of sites with community advice and request.

The information from both hare and small mammal surveys is used in many other projects, for example, to predict furbearer abundance in the NWT. Other agencies or organizations also rely on results from the SMS and HTS to complement their studies.

In 2010, survey data were shared with researchers who are tracking environmental changes at Diavik Diamond Mines Inc. and who study the relationship between small mammal fluctuations and weather (Angélique Dupuch and Dr. Douglas Morris, Lakehead University, C. Krebs, University of British Columbia).

PARTNERS:

Environment and Natural Resources (Government of the NWT)
Deninu K'ue First Nation
Sahtu Renewable Resources Board
Gwich'in Renewable Resources Board
Aurora College, Fort Smith

COMMUNITY INVOLVEMENT:

Over the years, biologists from government, co-management boards and non-profit organizations, Renewable Resources Officers, academic researchers, and environmental consultants have participated in data collection for both projects. At some sites, students assisted in data collection within research camps or school field courses.

Data from Tsu Lake camp (Aurora College) are now integrated into the NWT small mammal and hare transect surveys. Historical data from that site have been collected by students in most years since 1989. The success of the NWT SMS and HTS is possible because of the combined efforts of all project participants.

CONTACTS AND PARTICIPANTS:

Norman Wells: Richard Popko (Wildlife Technician, ENR, Sahtu Region, GNWT)

Yellowknife: Suzanne Carrière (Biologist, ENR, Wildlife Division, GNWT), K.Gesy (University of Saskatchewan), C. Fraser (ENR, Land and Water, GNWT), Stephanie Yuill. (ENR, Public Education, GNWT)

Bliss Lake: North Slave Office, ENR, GNWT

Gordon Lake: Suzanne Carrière (Biologist, ENR, Wildlife Division, GNWT), Sean McGee (Student, ENR, GNWT)

Daring Lake: Steve Matthews (Biologist, ENR, Wildlife Division, GNWT) and students at Daring Lake Tundra Science Camp

Fort Simpson: Danny Allaire (Wildlife Technician, ENR, Dehcho Region, GNWT)

Fort Smith: Ryan Greig (Intern Wildlife Biologist, ENR, South Slave Region, GNWT)

Tsu Lake: Aurora College

Fort Resolution: Ryan Greig (Intern Wildlife Biologist, ENR, South Slave Region, GNWT)

Inuvik: Kristen Callaghan, Janet Boxwell, Martin Callaghan (Gwich'in Renewable Resources Board)

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Photo: Environment and Natural Resources, GNWT

Ecological Regions (Ecosystem Classification) of the Northwest Territories Arctic Islands

Period: 2010/11 – 2011/12

Main Investigator: Robert Decker, Wildlife Biologist Habitat Conservation, Environment and Natural Resources, GNWT

Wildlife Research Permit Number: WL007377

LOCATION:

Northwest Territories Arctic Islands.

RATIONALE:

All provinces and territories have some form of hierarchical ecological land classification (ELC) that integrates climate, physiography and biotic factors in some fashion. These classifications can be a useful tool/framework for ecosystem-based resource management and land use planning as well as for understanding the effects of climate change, cumulative effects and natural disturbance on the landscape.

The only existing NWT-wide ELC, *National Ecological Framework for Canada* (1996), has been a poor fit for managing biological systems – largely due to its physiographic bias and the fact that climate was only an attribute and not an integral component of the classification.

Environment and Natural Resources (ENR) recognized, nearly a decade ago, the need for a more relevant landscape-level ecological classification framework, along with revised mapping of ecological regions of the Northwest Territories (NWT).

In 2004, ENR (jointly Wildlife and Forest Management Divisions) began a program to meet this need, with the initial focus on the Mackenzie Valley (Taiga Plains) and shield (Taiga Shield), due to potential looming oil & gas and mining developments. The revised ELC and mapping has been completed for all the forested portions of the NWT (2004-2010). Work began in 2009 on the new ELC for tundra areas of the mainland (Southern Arctic), with completion due in 2011. The success of the program carried out on the mainland to date led to a commitment by ENR (Wildlife) to see a consistent and seamless new ELC completed for the entire NWT.

OBJECTIVE:

To complete the ELC coverage for the remainder of the NWT – Arctic Islands.

METHODS:

The ELC work involves integrating existing information on geology, landforms, climate and vegetation, as well as new data collected through intensive field programs to revise, describe and map at various broad scales (from national/territorial to regional), the ecological regions of the NWT.

The additional data as well as the intensive photo record collected during the field programs is critical to this process. The current three-person field crew members (ENR project lead, ecologist contractor, arctic soils specialist) have been involved with the ELC program from its inception and responsible for all of the interpretation and ecological mapping being undertaken through completion of the Arctic Islands ELC work.

RESULTS AND MAIN CONCLUSIONS:

A Cessna 337 aircraft retro-fitted with a sliding camera window (front passenger side) was used to take several thousand high resolution oblique landscape photos over an 11-day period in July, 2010. The area covered included all of Banks Island and the NWT portion of Victoria Island. Surveys were flown from the communities of Ulukhaktok and Sachs Harbour. Since the aircraft required good airstrips to operate from, no ground sampling (ground-truthing) was possible last summer.

Preliminary mapping of the ecological units of the southern NWT Arctic Islands was undertaken during a workshop in early December 2010.

LONG-TERM PLANS AND RECOMMENDATIONS:

A second field program is planned for summer 2011. Aerial surveys (helicopter) to gather a comprehensive photo record of high resolution oblique landscape photos (8,000 -10,000 photos), as well as ground-truthing stops (3 - 5/day) are to be carried out over a two-three week period beginning about July 10, 2011. The first two weeks will be spent surveying the northern Arctic Islands (Melville, Prince Patrick, Eglinton, Emerald, Borden, Brock, and Mackenzie King Islands). These surveys will be flown from the airstrip at Mould Bay (Prince Patrick Island). This will be followed by approximately two to three days flying out of each community (Sachs Harbour and Ulukhaktok).

Mapping of the ecological areas of the NWT Arctic Islands is scheduled to be completed in 2011/12. A final report and poster, that will also be available to download from ENR's website, is scheduled to be completed in 2012.

PARTNERS:

Environment and Natural Resources
Environment Canada

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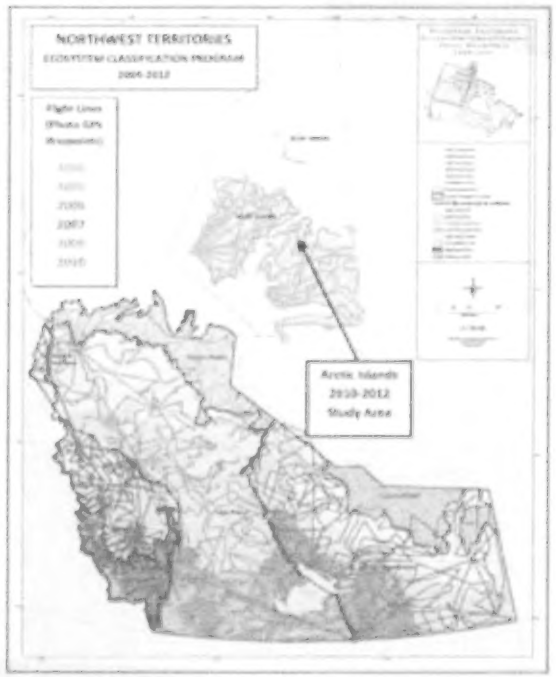

Ecosystem Classification System
Environment and Natural Resources

Protected Areas Strategy Shúhtagot'íné Néné

Period: June 09, 2010 to June 30, 2010

Main Investigator: Blake Bartzen, Habitat Biologist, Canadian Wildlife Service, Inuvik

Wildlife Research Permit Number: WL005157

LOCATION:

Surveys were conducted in the Mackenzie Mountains, west of Tulita and Norman Wells, NWT.

RATIONALE:

This research was performed as part of a Phase II Ecological Assessment of the Shúhtagot'íné Néné Candidate Protected Area, as part of the Northwest Territories Protected Areas Strategy (PAS).

Photo: B. Bartzen

OBJECTIVES:

Few data exist on the avifaunal richness and abundance in Shúhtagot'íné Néné. Filling this knowledge gap is important in determining conservation value of the area for many bird species including several species at risk. The objectives of this research were to document the distribution and abundance of birds (particularly passerines, waterfowl and cliff-nesting raptors), and provide baseline data for future bird studies in the area.

METHODS:

Systematic surveys for passerines were performed using a sampling grid of three 10 minute point count stations placed at least 300 m from each other within a homogenous habitat type. Songbird point count surveys were recorded using omni-directional microphones for analysis by expert birders. Observers accessed each sampling area by helicopter due to their remote location, and to increase the efficiency of the surveys. Surveys were conducted June 10 - 29 when most songbird species exhibit territorial behaviour. Species, sex and behaviour (e.g. flushed, territorial display, flyover) of each bird and their abundance were recorded for each bird observation wherever possible. Habitats were surveyed randomly on the landscape and were classified using the Canadian Forest Service's *Earth Observation for the Sustainable Development of Forests* (EOSD) digital land classification. Opportunistic aerial waterfowl and cliff surveys were performed whenever suitable habitats (wetlands, river, cliffs) were encountered (e.g. in transport).

RESULTS AND MAIN CONCLUSIONS:

This research was valuable in determining the distribution and abundance of birds that nest in the Shúhtagot'íné Néné Candidate Protected Area. A total of 2,633 birds representing 78 species were detected on avian point-counts (83 point count plots, 249 point-counts), aerial waterfowl and cliff surveys, and incidental observations. A total of 490 waterfowl representing 18 species were observed, including lesser scaup, northern pintail, American widgeon and tundra swan. Species detected within the study area and outside of their breeding range include red-throated loon, harlequin duck, barrow's goldeneye, and long-tailed duck. Several rare shorebird species were observed including

wandering tattler and Baird's sandpiper. A total of seven raptor observations were made representing four species, including golden eagle, northern hawk owl, rough-legged hawk, and bald eagle. Rock and willow ptarmigan were observed 44 times. A total of 1,975 passerine observations representing 39 passerine species were recorded, of which the five most common were white-crowned sparrow, American tree sparrow, American robin, Wilson's warbler, and savannah sparrow. One passerine species at risk (olive-sided flycatcher) and several species outside of their published ranges (palm warbler, golden-crowned sparrow) were observed. Two rusty blackbirds (special concern) were detected. Incidental observations were made of 29 moose, 666 mountain caribou, 97 Dall's sheep and 6 grizzly bears. This research concludes field work for the Phase II Ecological Assessment of the area that includes a detailed review of the findings of our research. Due to the high richness of bird species and the unique bird community assemblage documented with our research, Shúhtagot'iné Néné is of high conservation value.

LONG-TERM PLANS AND RECOMMENDATIONS:

The Canadian Wildlife Service (CWS) recently sponsored Shúhtagot'iné Néné and is recommending it be permanently protected as a National Wildlife Area under the Canadian Wildlife Act. Once established, CWS along with Shúhtagot'iné Néné working group will develop a management plan that will include long-term wildlife monitoring.

PARTNERS:

Government of the Northwest Territories

COMMUNITY INVOLVEMENT:

The application for this permit was reviewed and approved by the Tulita and Norman Wells Renewable Resources Councils and the Sahtu Renewable Resources Board. We hired William Horassi, who is a Sathu beneficiary from Tulita, NWT, to assist with the three week field work component of the project. William's involvement in the field research was invaluable. We also hired Canadian Helicopters and North-Wright Airways from Norman Wells to transport us and fuel to and from our field sites in the Mackenzie Mountains. For a portion of the trip, accommodations were provided by Drum Lake Lodge, operating out of Tulita, NWT. We also purchased field supplies from Norman Wells.

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Ecological Assessment of the Ka'a'gee Tu Candidate Protected Area

Period: June 2010

Main Investigator: Kevin Kardynal, Habitat Biologist, Canadian Wildlife Service

Wildlife Research Permit Number: WL004808

Photo: K. Kardynal

LOCATION:

The Ka'a'gee Tu Candidate Protected Area is located in the Dehcho region and surrounds the community of Kakisa, NWT.

The candidate area is bordered by Beaver Lake and Great Slave Lake in the northeast, the Cameron Hills and Dogface Lake in the south and Kakisa in the north.

RATIONALE:

Ka'a'gee Tu is a candidate National Wildlife Area being proposed through the NWT Protected Areas Strategy (Mackenzie Valley 5-year Action Plan). It is a partnership between the Canadian Wildlife Service, the Ka'a'gee Tu, K'atl'odeeche and Deh Gah Gotie First Nations and several other organizations. As part of Step 5 of the NWT Protected Areas Strategy process, an ecological assessment must be conducted to identify the key ecological components in the candidate area before a final decision can be made to proceed with legally designating the site as a National Wildlife Area and to recommend final boundaries. Ecological values within Ka'a'gee Tu area are not well known, including the spectrum of migratory birds that use the area.

OBJECTIVES:

To conduct an ecological inventory of the Ka'a'gee Tu Candidate Protected Area;

To develop an inventory of avifauna, determine their abundance and assess the potential value of a national wildlife area for their conservation;

To provide information for the identification of important ecological sites within the area; and

To generate baseline data for the candidate protected area to be used for long-term monitoring programs.

METHODS:

Songbird surveys were conducted at sites randomly selected (using a random point generator) within the Ka'a'gee Tu Candidate Protected Area. Field workers travelled to sites via helicopter. Birds were identified by an expert observer in the field or after the field season for point counts that were recorded using a bioacoustic monitoring recording unit.

Three songbird point counts were surveyed in a triangular grid pattern at each site, spaced at least 300 m apart. Wildlife observations between stations, and vegetation information at each site were also recorded.

RESULTS AND MAIN CONCLUSIONS:

In 2010, 38 sites (114 point count stations) were surveyed within the Ka'a'gee Tu boundary, with a total of 1,131 birds representing 79 species detected. The five most abundant species were: chipping sparrow, Swainson's thrush, palm warbler, Tennessee warbler and yellow-rumped warbler. Several species at risk including olive-sided flycatcher (five), rusty blackbird (14) and Canada warbler (four) were also detected in the study area. The nearest known population of Canada warblers is approximately 150 km from the birds detected in the Cameron Hills in the southern portion of the study area, which represents a significant range extension for this species, and an important discovery in understanding the ecological values of the area.

The avifauna of Ka'a'gee Tu has not been surveyed previously so this study adds greatly to understanding the bird community composition of the area.

LONG-TERM PLANS AND RECOMMENDATIONS:

The information from this study will be used in making decisions on final boundary recommendations and management plans by the working group for the Ka'a'gee Tu Candidate National Wildlife Area.

Additional surveys for species at risk (e.g., Canada warbler, olive-sided flycatcher, rusty blackbird) may be undertaken in 2011 to further determine the value of the candidate area for these species. Songbird surveys from 2009 and 2010 will form the basis of a songbird monitoring program that will be implemented once the area is established as a National Wildlife Area.

PARTNERS:

Ka'a'agee Tu First Nation
Deh Gah Gotie First Nation
K'atlo'deeche Dene Band
Ducks Unlimited Canada

COMMUNITY INVOLVEMENT:

There has been extensive community consultation associated with developing the Ka'a'gee Tu Candidate Protected Area proposal and the community is aware of the need to conduct resource assessments in the candidate area.

One individual from Kakisa was hired for the 2010 field work to assist with songbird surveys.

Photo: K. Kardynal

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Ecological Assessment of Kwets'ootł'àà Candidate Protected Area

Period: Spring, Summer and Fall 2010

Main Investigator: Kevin Kardynal, Habitat Biologist, Canadian Wildlife Service

Wildlife Research Permit Number: WL005688

Photo: Canadian Wildlife Service

LOCATION:

Kwets'ootł'àà Candidate Protected Area encompasses approximately 660 km^2 of the northern portion of Great Slave Lake's North Arm. It includes the mainland shoreline, numerous islands, and open water areas of the lake itself. The community of Behchokǫ̀ is located just outside the candidate area boundary to the northwest.

RATIONALE:

Kwets'ootł'àà is a candidate protected area under the NWT Protected Areas Strategy (PAS) and the federal *Completing Conservation Planning in the NWT* initiative. It is a partnership between the Tłı̨chǫ Government, the community of Behchokǫ̀, the Canadian Wildlife Service (CWS), and the Government of the Northwest Territories, and is currently at Step 5 of the 8 Step PAS process.

Step 5 of the NWT Protected Areas Strategy requires an ecological assessment of the candidate protected area to identify its key ecological components upon which to base future decisions regarding the protected area boundary and its management. CWS conducted waterfowl and waterbird surveys along the north shore of the North Arm in the 1990s; however, this information requires updating.

OBJECTIVES:

To conduct aerial and ground-based surveys of waterfowl and waterbirds in Kwets'ootł'àà Candidate Protected Area;

To assess the importance of the wetlands to spring and fall staging waterfowl and waterbirds;

To assess the current status of important waterfowl and waterbird nesting colonies identified in earlier CWS research;

To identify important ecological sites within the area;

To generate baseline data for the candidate protected area for potential future monitoring; and

To assess the toxicological characteristics of local waterbirds in relation to national data.

METHODS:

An assessment of staging waterfowl on the North Arm was done via aerial surveys using a Bell 206B helicopter. Surveys were conducted with two observers. A total of 22 surveys were flown between May 8 and October 22 in order to capture spring and fall migration periods.

Each aerial survey consisted of flying along a predetermined transect route which covered either shoreline or open water regions of the lake. The same transects were flown on each survey date in

order to maintain consistency between surveys. All transects were flown at a speed of 80 km/hr and at a height of 45 m in the spring, and 60 m in the fall to be consistent with surveys in the 1990s.

All bird observations within either 250 m (spring) or 400 m (fall) of the flight path were recorded. Information for each bird observation, such as time of observation, species (if known), and number of birds was recorded.

A census of breeding larids (gulls and terns) was conducted June 22-29 by examining all islands within the study area for potential breeding colonies. The total number of nests, the number of eggs and young in each nest, and the number of adults at each site were recorded and identified to species. Boats were used to travel to islands on the North Arm.

RESULTS AND MAIN CONCLUSIONS:

Over the course of the spring and fall aerial survey periods, we observed a total of 136,905 ducks, geese and swans, and approximately 40 different bird species on the North Arm of Great Slave Lake.

Spring Aerial Surveys

Diving ducks were the most abundant bird group present on the North Arm in spring with a total count of 11,840 ducks during the survey period. Of those ducks that could be identified to species, the most common were mergansers (7,190) and scaup (2,030). We also observed 5,680 Canada geese, 3,510 dabbling ducks (primarily mallard) and 3,030 swans.

Peak numbers of Canada goose and dabbling ducks were observed on May 12. Swan numbers reached a maximum on May 18. The highest abundance of diving ducks were observed on May 18 and June 12. Gulls and terns were most numerous on June 12.

Trout Rock and Stagg River were the most used areas by all species during the spring surveys.

Fall Aerial Surveys

Dabbling ducks were the most abundant bird group present on the North Arm during fall, with a total of 40,700 counted during the survey period. Mallards accounted for over 50% of this total and unidentified dabbling species represented approximately 30% of the total.

Diving ducks were also abundant with a total of 36,140 counted during the fall survey period including 12,940 scaup, 8,510 unidentified diving species, 6,400 mergansers, and 3,410 common goldeneye.

Ducks that could not be identified as a 'dabbler' or 'diver' were classified as 'duck'. This group totaled 28,580 during the fall survey period.

Canada goose abundance was highest on our first fall survey and declined to zero by mid-September.

Swan use of the North Arm during the fall peaked between mid-September and early October. Peak number of swans was 272 adults and 82 young on October 2, 2010.

During the fall, Trout Rock and Stagg River areas were the most used by dabbling duck species and Enodah area was the most used by diving ducks and Canada geese.

Larid Survey

A total of 1,055 nests were found at larid colonies on survey routes located within the study area boundary. Common and arctic terns were the most numerous larid species nesting on the North Arm in 2010, and were often found together at mixed colonies.

Larid nests were found along the northern shoreline between Frank Channel and Trout Rock, and no nests were found along the southern shoreline and around Waite Island. The highest densities of nesting larids occurred in the Trout Rock and Smith Island areas.

On June 15, prior to larid surveys, 15 herring gull eggs were collected for contaminants analysis at Environment Canada laboratories in Burlington, ON. Contaminant levels will be compared to other samples collected across the country. Results are pending.

LONG-TERM PLANS AND RECOMMENDATIONS:

The information from this study will be used in the decision on whether to proceed with the Kwets'ootł'àà protected area designation process, to determine a recommended final boundary and the preparation of a subsequent management plan.

Information and data are still being analyzed to determine whether another field season is necessary to complete the ecological assessment report.

COMMUNITY INVOLVEMENT:

Moise Rabesca of Behchokǫ provided guiding services and participated in surveys of gulls and terns on the North Arm. All stakeholders with interests in the candidate protected area are involved in reviewing the ecological assessment through participation on the Kwets'ootł'àà Working Group.

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Photo: Canadian Wildlife Service

Photo: Environment and Natural Resources, GNWT

Tuktoyaktuk Wind Farm Bird Monitoring Project

Period: June 18, 2010 to July 31, 2010

Main Investigator: Steve Moore, EBA Engineering Consultants Ltd., Yellowknife, NWT

Wildlife Research Permit Number: WL007417

LOCATION:

Within the municipal boundaries of Tuktoyaktuk, NWT.

RATIONALE:

Collection of bird information in support of future anticipated environmental assessment and regulatory permitting requirements.

OBJECTIVES:

To document breeding bird territories within the proposed wind farm footprint;

To document temporal and spatial distribution of bird species (gull species and ravens) utilizing Tuktoyaktuk's landfill site; and

To document the corridor used by these bird species in commuting between their daily roosting spots and the landfill.

METHODS:

Breeding Bird Surveys

Spot mapping and line transects will be used for calculating abundance values within a 200 m x 400 m plot (wind farm footprint). Surveys occurred between 4:00 am to 10:00 am, for a period of 15 minutes (5 minute settling period and 10 minute bird count).

Landfill Surveys

Multiple avifauna surveys will be conducted to document local bird concentrations, with emphasis focus on gulls, and movements in and around the Tuktoyaktuk landfill.

RESULTS AND MAIN CONCLUSIONS:

No results and main conclusions submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

No long-term plans and recommendations submitted.

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Muskwa Plateau and Beaver River Wildlife Inventory

Period: March 22, 2010 to March 23, 2010

Main Investigators: Troy Pretzlaw, Regional Biologist, Environment Yukon and Shannon Stotyn, Biologist, Canadian Wildlife Service, Yukon

Wildlife Research Permit Number: WL005027

LOCATION:

The study area coincided with the Muskwa Plateau ecosystem, in the southeast corner of Yukon and adjacent Northwest Territories and British Columbia. The nearest community to the study area is Fort Liard, approximately 25 km to the east of the study area.

RATIONALE:

The Muskwa Plateau is an ecoregion that differs zoogeographically from much of the rest of the Yukon and hosts a slightly different mammal community. This is also the only area of the Yukon with active oil and gas development and may have future development pressures. It is expected that several rare species (elk and white-tailed deer) and species-at-risk (boreal woodland caribou and wood bison) occur in the area.

No current knowledge of boreal caribou (*Threatened* species) use of Muskwa Plateau Ecozone in the Yukon. This species may be experiencing decline associated with resource exploration and extraction activities, such as those documented in Alberta.

This project was funded through Canadian Wildlife Service (CWS) primarily for the purpose of gathering data on two species at risk, wood bison and boreal caribou. The data generated by this study will feed into future assessments of these species.

OBJECTIVES:

To provide baseline information on the occurrences and distribution of several important species in a region with high biodiversity values and increasing resource development pressures – the Muskwa Plateau ecoregion.

Species to be inventoried include woodland caribou, wood bison, elk, mule deer, white-tailed deer and moose, as well as sign of other mammals (e.g. beaver, otter, and porcupine).

METHODS:

We flew a systematic aerial survey in Bell 206 helicopter to locate animals or their tracks using an occupancy modeling framework. The study area was divided into grid cells that were flown to determine the presence or absence of caribou, bison and other ungulates. All data was geo-referenced.

RESULTS AND MAIN CONCLUSIONS:

The survey was carried out March 22 and 23, 2010. Weather conditions allowed for good visibility of observing animals and tracks. Due to a combination of low ungulate densities, possibly a lack of some species and limited survey intensity, we only observed moose during the survey. A single bison carcass was discovered within the study area. Moose and bison tracks were also identified and recorded within the study area.

The lack of observing boreal caribou, elk or tracks of either, does not preclude their presence in this area. Our low search intensity gave some indication that there is not significant use and movement of boreal caribou, elk or bison through this area in late winter. However, more resources and alternate methodologies would be required to draw conclusions about the overall importance of this area to boreal caribou, elk and bison.

LONG-TERM PLANS AND RECOMMENDATIONS:

It is recommended that a more intensive survey be conducted to establish the occurrence of woodland caribou, wood bison, elk, mule deer, white-tailed deer, and moose prior to any new major industrial activity in this region. Yukon Government does not currently have plans to conduct such a survey.

PARTNERS:

Environment Yukon (Yukon Government)
Fish and Wildlife Branch (Watson Lake)
Canadian Wildlife Service, Environment Canada (Government of Canada, Whitehorse)

Funding Sources:
Canadian Wildlife Service
Environment Canada
Environment Yukon

COMMUNITY INVOLVEMENT:

This survey was for a short duration and was a trial of a new survey technique making it very difficult to include local observers in the small aircraft which was used out of Watson Lake. Discussions regarding caribou and other ungulates in these areas have also occurred with hunting outfitters, as well as other hunters and residents in the Watson Lake area.

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Photo: Environment Yukon

2010 Baseline Environmental Studies, Nechalacho Rare Earth Element Project

Period: June 8-13, 2010 and July 19-23, 2010

Main Investigator: Steve Moore, EBA Engineering Consultants Ltd.

Wildlife Research Permit Number: WL005694

LOCATION:

Nechalacho Rare Earth Element Project Site, Thor Lake, NWT.

RATIONALE:

These studies are a continuation of baseline environmental work conducted on site by Stantec, (formerly Jacques Whitford) in support of future anticipated environmental assessment and regulatory requirements, should the proposed development proceed. These 2010 surveys serve to fill in information gaps on wildlife and wildlife habitat in the Thor Lake area.

OBJECTIVES:

To conduct breeding bird and waterfowl surveys; and

To document incidental wildlife and wildlife sign for a preliminary wildlife habitat assessment.

METHODS:

Breeding bird surveys were completed in early June using point-count sampling methods. Surveyors accessed all point count stations on foot. All birds seen or heard were recorded at each 100 m radius point-count station for the period of 10 minutes. Corresponding habitat type and UTM coordinates were also recorded.

Waterfowl were surveyed in June and July using the "look see" method, which involved a slow scan of a waterbody using binoculars for a minimum of 15 minutes. In general, waterbodies were surveyed from the shore; however, Thor Lake was surveyed from a motorized zodiac and the shoreline of seven lakes (those with limited access) were surveyed with a helicopter.

All wildlife, wildlife sign and the associated habitat was recorded in concert with other field programs to later determine wildlife use within each habitat type. This information was used, in association with documented literature on the biology of species, to understand wildlife-habitat interactions at the study area.

RESULTS AND MAIN CONCLUSIONS:

A 2010 baseline wildlife and wildlife habitat assessment report was prepared.

A total of 39 breeding bird stations were surveyed in eight different habitat types. A total of 199 breeding birds were recorded and an additional 138 birds were recorded as incidentals (either outside the survey station or outside the survey time). A total of 23 bird species were detected and an additional seven species were detected as incidentals. Of the species recorded during the breeding bird survey, the yellow-rumped warbler was by far the most common breeding bird detected, followed by Swainson's thrush, chipping sparrow, and American robin. Using the Shannon-Wiener Index, habitat types with the highest species diversity was the black spruce-tamarack-water sedge fen and the black spruce-cloudberry-sphagnum moss bog forest . Bedrock-lichen-juniper-saxifrage and lichen-bearberry woodland habitats exhibited the lowest species diversity.

During the June and July waterfowl surveys, a total of 319 waterfowl were observed, with an additional 495 documented as incidentals. In June, waterfowl were surveyed on 21 lakes and ponds (or portions thereof); 18 of which were surveyed on foot, and 7 were first surveyed or re-surveyed from a helicopter. In July, a total of six lakes and ponds were resurveyed on foot. Scaup species were by far the most common within the study area during both survey events.

A total of 280 mammal observations, including 12 different species were recorded within the local study area. Of these mammal observations, moose were the most common species recorded, followed by snowshoe hare, black bear, and red squirrel. Ten broad habitat types available within the local study area were assessed for their ability to support chosen indicator species for specific life requisites and seasons. Of the broad habitat types in the local study area, moderate to high barren-ground caribou habitat is included in bedrock-lichen, shrub-wet, sedge-fen, and open water habitat types. Moderate to high moose habitat includes broadleaf upland, shrub fen, sedge fen, and open water habitat types. Moderate to high olive-sided flycatcher habitat includes bedrock-lichen, shrub wet, and shrub fen habitat types. Moderate to high rusty blackbird habitat includes treed fen, shrub fen, and sedge fen habitat types; whereas moderate to high common nighthawk habitat includes bedrock lichen, treed fen, shrub wet, sedge fen, and open water types.

LONG-TERM PLANS AND RECOMMENDATIONS:

Results from the 2010 baseline surveys will be included within a Developers Assessment Report for submission to the Mackenzie Valley Environmental Impact Review Board.

PARTNERS:

Avalon Rare Metals Inc.

COMMUNITY INVOLVEMENT:

Denecho Catholic, a field trainee from Łutsel K'e Dene First Nation, was hired for both field events. Denecho was trained in conducting breeding bird and waterfowl surveys, and was also involved in the observation and identification of wildlife sign, as part of the wildlife habitat assessment. As originally agreed upon, a summary report and field data will be sent to the Łutsel K'e Dene Wildlife, Lands and Environmental Committee. A summary report is available to each community upon request.

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Thor Lake local study area.

MMG Resources Inc. Izok Project, Wildlife and Wildlife Habitat Baseline Studies

Period: August, 2010 to September, 2010

Main Investigator: Kim Poole, Aurora Wildlife Research

Wildlife Research Permit Number: WL005698

LOCATION:

Thirty kilometre buffer surrounding the proposed Izok mine site to the Lupin mine site on the shores of Contwoyto Lake.

RATIONALE:

Baseline wildlife studies are required as part of MMG Resources Inc.'s Izok Project. Baseline wildlife studies were conducted in 2008, but subsequent research was put on hold due to economic uncertainty. No wildlife research was conducted in 2009, and in 2010 a limited baseline wildlife program was initiated. This report summarizes wildlife baseline studies conducted for ungulates in late summer and fall 2010.

OBJECTIVES:

To gather environmental baseline data to support environmental assessment of the Izok project; and

To provide the information needed to develop a project proposal / environmental impact statement for review by the Nunavut Impact Review Board.

METHODS:

The aerial ungulate survey involved flying at ~150 m above ground level and ~140 to 160 kph over the study area on a systematic transect system (15 km x 1 km wide north-south oriented transects spaced 8 km apart), and documenting the occurrence of caribou and muskoxen and the presence of any other large mammals.

Known migratory patterns of the Bathurst, Ahiak and Bluenose East caribou herds have been derived based in part on traditional knowledge of migratory behaviour and on satellite collar location. Timing of programs was selected based on these migratory patterns; collar movement also helped with interpretation of observations.

RESULTS AND MAIN CONCLUSIONS:

August Survey

The survey was completed on August 11, 2010 using a Cessna 185 aircraft on floats, based out of Lupin. The local observer from Kugluktuk was not able to reach the site due to weather; therefore the survey was conducted with a pilot and two observers.

Survey conditions were good. Twenty-seven caribou and one group of 26 muskoxen (four calves) were observed during the survey, as well as one wolf and one grizzly bear. Caribou were observed primarily west of Izok camp and were likely from the Bluenose-East herd.

September Survey

The September ungulate survey was conducted using a Bush Hawk aircraft on floats on September 18 and 19, 2010, with a pilot and three observers. Lupin was the base of operations. Survey conditions were again good, with variable light snow over (0-25%). Approximately 1,100 caribou were observed, primarily near and west-northwest of Lupin. According to satellite collar data, these were most likely Bathurst caribou. Group sizes were estimated at up to 200, a mixture of cows, calves and bulls.

Two groups of muskoxen were observed with 62 (four calves; north of Izok camp) and 23 (no calves; north-northwest of Lupin) animals in each group. In addition, one grizzly bear and three single wolves were observed. The single bears observed during August and September surveys were likely different individuals based on colouration.

LONG-TERM PLANS AND RECOMMENDATIONS:

MMG Resources Inc. will conduct further wildlife baseline research once decisions on the project are completed. Future studies will focus on caribou, muskoxen, carnivores, and birds. At this time, MMG plans to continue the ungulate surveys in 2012 and 2013 and may also conduct bird and raptor surveys in 2012. Decisions about these future programs will be made in November 2011 and permit applications will follow.

PARTNERS:

No partners; community support for Government of the Northwest Territories and Government of Nunavut wildlife research permits was received.

COMMUNITY INVOLVEMENT:

J. Lee of Yellowknife, NT and B.J. Atatahak of Kugluktuk, NU provided assistance as observers and logistical support. S. Reitsma (Air Tindi) and D. Olesen (Husky Air) provided aircraft.

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De Beers Snap Lake Mine: Wildlife Effects Monitoring Program

Period: March 30, 2010 to December 31, 2010

Main Investigator: Alexandra Hood, Permitting and Environmental Superintendent, Snap Lake Mine

Wildlife Research Permit Number: WL005687

LOCATION

All wildlife studies took place within a study area of 31 km radius around the Snap Lake Mine, a total area of 3,019 km^2.

RATIONALE

The wildlife effects monitoring program (WEMP) is a requirement of the project's environmental agreement (article vii, 7.2c) and land use permit (condition 36).

The annual Snap Lake WEMP is designed to detect, measure, and manage mine-related impacts to wildlife habitat, wildlife presence, behaviour and distribution, and wildlife injuries and mortalities. WEMP is intended to provide information for the mine's environmental management system (EMS) to adaptively manage the mine to protect wildlife and wildlife habitat, and to contribute to regional monitoring information that may then be used to assess cumulative effects of mining on wildlife.

OBJECTIVES

To determine annual variability, the following species indicator variables (endpoints) within the study area were examined:

- the density, distribution, group composition and behaviour of caribou;
- the relative activity (presence) and distribution of grizzly and black bears;
- the relative activity (presence) and distribution of wolverines;
- the presence, distribution, and production of wolves (not part of the WEMP, data is provided to ENR); and
- the distribution, nest occupancy, nest success, and production of raptors.

Photo: Golder and Associates Ltd.

METHODS

Further details on methods can be found in the annual WEMP reports, the Snap Lake Wildlife Monitoring Plan, and the Snap Lake Wildlife Management Plan.

The fall aerial survey was flown on November 15, 2010 with an North Slave Métis Alliance (NSMA) elder. A caribou camp was held south of Mackay Lake with community representatives from the NSMA, Yellowknives Dene First Nation (YKDFN) and Tłı̨chǫ. Data gathered is used to monitor caribou abundance, distribution, group composition, and behaviour within the study area.

A new study design was initiated for bears in 2010, based on hair snagging stations. During May 2-24, 2010, 40 hair snagging stations were deployed in the historic visual monitoring plots. Hair snagging stations were scented with commercial lures. The objective was to measure the presence and distribution of grizzly and black bears. During June 3-26, 2010, each station was checked for hair, every eight days.

The wolverine snow track survey was not completed in 2010.

A helicopter survey for raptors nests and wolf dens was completed on June 6, 2010 and July 30, 2010 to determine occupancy and productivity of identified nest and den sites.

Interactions with wildlife on site are documented and managed by the De Beers environmental staff, and this information is reported in the annual wildlife effects monitoring program report.

RESULTS AND MAIN CONCLUSIONS

Results of the 2010 WEMP will be presented in the 2011 annual wildlife effects monitoring report. Although there continue to be interactions with wildlife on site, there has been no caribou, wolf, grizzly bear, black bear or wolverine mortalities at the Snap Lake Mine.

LONG-TERM PLANS AND RECOMMENDATIONS

Wildlife monitoring will continue during the entire operational period of the Snap Lake Mine, as per Snap Lake Mine Wildlife Effects Monitoring Plan.

PARTNERS

De Beers Canada Inc.
Golder Associates Ltd.
Snap Lake Environmental Monitoring Agency

COMMUNITY INVOLVEMENT

Community feedback on the WEMP has been provided through the Snap Lake Environmental Monitoring Agency (SLEMA). Community involvement in the field studies included aerial caribou surveys with community elders [Wayne Langeham, (NSMA)]. A caribou camp was held by De Beers on the south end of Mackay Lake in September; elders from the Łutselk'e Dene First Nation, YKDFN, Tłı̨chǫ and NSMA were present. Pete Enzoe of Łutselk'e was involved in the grizzly bear surveys.

CONTACTS

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Photo: A. Hood

Gahcho Kué Environmental Monitoring

Period: January 2010 to December 2010

Main Investigator: Golder Associates Ltd.

Wildlife Research Permit Number: WL005685

LOCATION:

Studies occurred in the wildlife regional study area (RSA) of the Gahcho Kué Project, which is located next to Kennady Lake. The nearest community to the project is Łutselk'e.

RATIONALE:

Data collected from the wildlife studies will be used to provide estimates of the natural variation in wildlife presence, abundance, distribution, and movements within the study area.

OBJECTIVES:

To support permit applications and the environmental assessment review process;

To predict and mitigate effects to the environment and wildlife that may result from project development;

To provide pre-development information in support of a future environmental effects monitoring program; and

To contribute to regional studies for assessing and managing potential cumulative effects.

METHODS:

In 2010, baseline wildlife studies were completed in the 5,700 km^2 RSA surrounding the project. The surveys were completed with the assistance of representatives of the Yellowknives Dene First Nation (YKDFN) and Łutselk'e Dene First Nation (LKDFN).

RESULTS AND MAIN CONCLUSIONS:

March and April surveys:

Wolverine presence and distribution within the study area were recorded using snow track surveys along 50 transects, 4 kilometers (km) in length, placed throughout the study area. The location, direction and number of tracks found were recorded.

June and July surveys:

Historic wolf den surveys within the study area were completed by helicopter to determine den occupancy and productivity.

Grizzly and black bear presence and distribution in the study area were determined using hair-snagging techniques. Approximately 40 hair-snagging posts were deployed throughout the study area. The posts were checked three times over the summer to autumn period, and all hair samples collected were recovered, and archived.

In June, all waterbirds observed during a helicopter survey of the perimeter of Kennady Lake (46.9 km) were recorded, including the species, location and the number of drakes and hens.

Helicopter surveys were completed in June to determine the number of raptors (i.e., peregrine falcon, gyrfalcon, rough-legged hawk, golden eagle) nesting in the study area. In July, nests were examined for chicks by flying the helicopter parallel to the cliff and counting the number of adults, eggs, and chicks present.

LONG-TERM PLANS AND RECOMMENDATIONS:

Wildlife baseline studies will continue as the permitting process for the project proceeds. All relevant results and will be presented in future permit applications.

PARTNERS:

De Beers Canada Inc.

COMMUNITY INVOLVEMENT:

De Beers Canada Inc. has been communicating information based on the completed surveys to local communities through meetings and tours of the Gahcho Kué Project. Residents of surrounding communities have been provided with the opportunity to contribute traditional knowledge and participate as field assistants in the implementation of the various environmental baseline programs.

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Fortune Minerals Ltd
Nico Project Wildlife Baseline Studies

Period: March 18, 2010 to December 31, 2010

Main Investigator: Golder Associates Ltd.

Wildlife Research Permit Number: WL005684

LOCATION:

All wildlife studies took place within a study area of 15 km radius of the Nico project, and within a 5 km radius of the proposed access road.

RATIONALE:

The data will be used to describe the local environment to support the environmental assessment process.

OBJECTIVES:

To describe the distribution, seasonal presence and behaviour of caribou within the study area;

To describe the presence and production of raptors nesting in the study area; and

To establish baseline values of selenium concentrations in aquatic wildlife receptors.

METHODS:

Aerial Wildlife Surveys

Two aerial wildlife surveys were completed by Found Bushawk, on March 22, 2010, and December 16, 2010.

Raptor Surveys

Known raptor nests were visited on May 18, 2010.

Ground Surveys

Searches on foot for frog and aquatic bird eggs were completed at Lou, Nico, Peanut, Bourke and Reference lakes and Pond 12.

RESULTS AND MAIN CONCLUSIONS:

Aerial Wildlife Surveys

Caribou, moose and wolves were observed. Numerous sets of caribou tracks were also observed and recorded.

Raptor Surveys

One new nest was discovered near Lou Lake. To date, 15 nests have been identified, occupied by bald eagle, great grey owl, peregrine falcon and raven.

Ground Surveys

Two frog egg masses were collected, frozen, and archived in Yellowknife for possible future selenium concentration analysis.

LONG-TERM PLANS AND RECOMMENDATIONS:

Wildlife baseline studies will continue as the permitting process for the Nico property proceeds. All relevant results and analysis will be presented in future permit applications.

COMMUNITY INVOLVEMENT:

Fortune Minerals Ltd. has maintained a constant communication with the surrounding communities, and there is local involvement in the operation of the Nico camp. Community assistants from North Slave Métis Alliance were requested for caribou surveys but were unable to participate during 2010.

PARTNERS:

Golder Associates Ltd.
Fortune Minerals Ltd.

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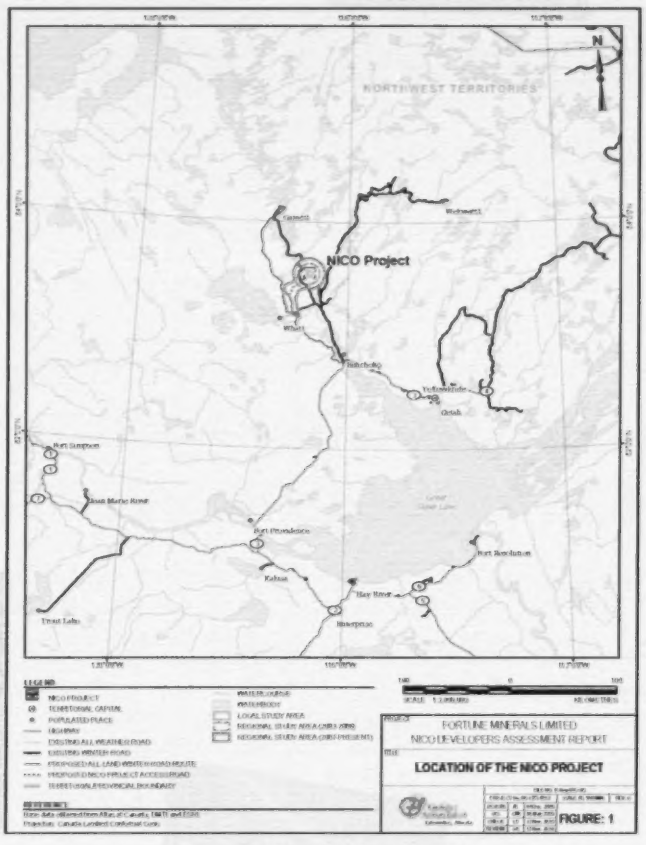

Quantifying Boreal Bird and Mammal Response to Human Land Use Practices in the Northwest Territories

Period: May 15, 2010 to September 8, 2010

Main Investigator: Dr. Erin Bayne, University of Alberta

Wildlife Research Permit Number: WL005752

LOCATION:

This study was conducted across the Dehcho territory in the Northwest Territories, in traditional Dehcho lands in NE British Columbia, and northwest AB. The 2010 research focus was on birds, and work was conducted near Fort Liard, Fort Simpson and Kakisa. No mammal work was conducted in 2010. Research was from May to September 2010.

RATIONALE:

Demand for oil and gas has resulted in a substantial increase in energy sector activity in the boreal forest. In the NWT, concerns regarding how development can be done in an economically-viable yet ecologically-sustainable manner have led to discussions around thresholds. Under a threshold-based management approach, development is capped at designated densities to protect valued natural resources like wildlife. In the Dehcho, this approach has been incorporated by setting seismic line density thresholds. However, we do not have a good understanding of how seismic lines actually impact wildlife or the long term recovery trajectories of lines. Thus, we do not know how many seismic lines are too many. We need to understand which seismic lines are disturbances and which have recovered sufficiently to be "taken off the books", to estimate appropriate threshold density targets and determine when those targets have been reached.

OBJECTIVES:

The objectives of this project are to determine how forest birds and mammals perceive and respond to seismic lines and line density at multiple spatial scales. Specifically, our objectives are:

To determine whether forest passerines and mammals use or avoid seismic lines at different states of vegetation recovery as compared to undisturbed forest interior locations;

To determine the effects of line width on bird & mammal use; and

To determine how landscape level density of seismic lines influences birds and mammals.

These data will enable us to: (a) identify the relationship between increasing seismic line density and changes in community structure and species occupancy rates, and (b) identify which lines are "disturbances" and which lines are recovered.

METHODS:

Birds were sampled using a combination of point counts and spot mapping. All point count sample locations were stratified *a priori* by habitat, seismic line type and cumulative seismic line density; and were paired between "line" and "interior" locations. Using a Geographical Information System (GIS), habitats were stratified into upland and lowland coniferous forest types. Seismic line types were categorized as one of three recovery categories using a combination of GIS analysis and visual estimation in the field.

RESULTS AND MAIN CONCLUSIONS:

In 2010, we focused on bird response to line recovery in lowland habitats and conducted ~ 350 point counts. Point counts were balanced between lines and forest interiors and among line recovery categories. We collected vegetation data at all point count locations.

Our preliminary results from the spot mapping work in 2008 and 2009 show that ovenbirds have a behaviorally driven response to line regeneration. Male ovenbirds strongly avoid bare lines and appear to use them as territorial boundaries. As the amount of vegetation on the lines increases, they still avoid lines and use them as boundaries, especially when local population density is higher. Because of this interaction between behaviour and habitat structure, even 40-year-old lines may have an effect on local ovenbird density.

Initial results of our point count data from 2008 and 2009 show that bird community metrics for songbirds in upland habitats show little long term response to lines. A few species initially respond positively or negatively, but, with a few exceptions this response disappears as vegetation height on lines increases.

Results from our 2010 surveys in lowland habitats will be available by the end of February.

LONG-TERM PLANS AND RECOMMENDATIONS:

Our research focus in 2011 will revolve around:

Completing and publishing the analysis of mammal response to seismic lines. Analyses will focus on determining which vegetation attributes correlate to line "recovery", determining threshold values for cumulative line densities, and comparing mammal response patterns between upland and lowland habitats.

Completing and publishing the analysis of songbird response to seismic lines. The analysis will focus on species and community responses to seismic line density, and regeneration at local and landscape scales.

No additional field work will be conducted in 2011.

Our long-term plan for this research are to determine, more precisely, which vegetation attributes correlate to line "recovery" for a variety of bird and mammal species, and to determine exactly how much time is required for a line to reach that state of recovery, given surrounding habitat and construction technique. A major report to Environmental Studies Research Fund will be completed by the end of February 2011. Tigner and Lankau theses will be completed by May and September 2011 respectively. All final documents will be provided to the Government of the Northwest Territories as final reporting for this project.

PARTNERS:

University of Alberta
Environment and Natural Resources
Environment Canada
Paramount Resources, Ltd.
Environmental Studies Recovery Fund
Horn River Basin Producers Group
British Columbia Ministry of Environment

COMMUNITY INVOLVEMENT:

All appropriate actions and contacts were made with required communities and groups as outlined on the Environment and Natural Resources website. All communities were contacted prior to beginning research activities. Responses were favorable and permission was granted without conditions.

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2010-2011

Western NWT Biophysical Study

RATIONALE

The Western NWT Biophysical Study was established to help ensure baseline data necessary to assess, mitigate and monitor the environmental impacts of proposed developments in the Western NWT is available to industry, regulators, communities and government. The program focuses on areas within the mandate of the Department of Environment and Natural Resources (ENR): wildlife, wildlife habitat, forests and air quality.

BACKGROUND

As the primary authority responsible for managing aspects of wildlife, wildlife habitat and forests in the NWT, the former Department of Resources, Wildlife and Economic Development (RWED) initiated a multi-party process to determine what these potential impacts could be and to work to find ways to limit possible negative implications. These areas of responsibility now reside within the Department of Environment and Natural Resources (ENR), formed from the partition of RWED into the Department of Industry, Tourism and Investment (ITI) and ENR on April 1, 2005.

In early 2004, RWED, in collaboration with the Department of Indian and Northern Affairs and Environmental Studies Research Funds, completed a project to identify biophysical information and research gaps associated with hydrocarbon exploration, development and transmission in the Mackenzie Valley. The Western NWT Biophysical Study has allowed the GNWT to initiate research projects necessary to address many of the gaps identified within ENR's mandate.

STATUS

The Western NWT Biophysical Study provided $899,950 towards projects in 2003 / 2004, $908,000 towards projects in 2004 / 2005, $894,000 towards projects in 2005 / 2006, $803,500 towards projects in 2006 / 2007, $750,000 towards projects in 2007/2008, $637,000 towards projects in 2008 / 2009, $390,000 towards prjects in 2009 / 2010 and $390,000 towards projects in 2010 / 2011. In addition to research projects, workshops are held in each of the Mackenzie Valley regions to review progress of the Study and to ensure priority information needs are being addressed. Partnerships with federal agencies, wildlife management boards, universities, non-government organizations and industry have been developed on a project-by-project basis. Most projects involve multiple partners.

DISCLAIMER

This publication provides summary reports for projects carried out under theWestern NWT Biophysical Study during 2010. Contact information for the main investigator leading each project has been included if you wish to obtain more information on a specific project.

The contents of each summary are the sole responsibility of the team leads for each project and do not reflect any official policy of ENR or the GNWT.

Population Dynamics, Physical Condition, Seasonal Movements, Health, Contaminants and Harvest of Barren-Ground Caribou – CLS America

Period: 2010-2011
Main Investigator: Heather Sayine-Crawford, Cumulative Effects Biologist, Environment and Natural Resources, Sahtu Region

RATIONALE

To collect movement data on barren-ground caribou within the Sahtu Settlement Area (SSA). The focus since1995 has been on identifying how many herds occur within the Sahtu through a combination of satellite tracking collared animals and genetic analysis.

After it was identified that the Bluenose-West and Bluenose-East caribou herds use the Sahtu, particularly during winter, the focus shifted to identification of seasonal and annual ranges and to use ofcollared animals to help produce accurate and precise population estimates and other measures of population performance (e.g., recruitment and adult sex ratio).

Radio tracking of satellite and GPS collared caribou provide data that are important for land use planning, protected areas planning (e.g., Edaiila in Sahtu), and environmental assessment and monitoring.

Satellite and GPS tracked collar data are acquired by the Department of Environment and Natural Resources (ENR) from CLS America through annual contracts with the company for this purpose. The Sahtu region of ENR is responsible for tracking and paying costs for collars on the Bluenose-East herd of barren-ground caribou – both within the Sahtu and in other parts of the NWT and western Nunavut.

OBJECTIVES

To identify, map, and verify barren-ground caribou annual and seasonal ranges in the SSA, with particular focus on changes over time.

To collect baseline population data through a combination of GPS and satellite-tracked radio collars.

METHODS AND INFORMATION COLLECTED

Since 1995 adult female barren-ground caribou have been captured, collared, and radio tracked by satellite-tracked radio collars. GPS collars have been used for tracking since 2003 and collars are now deployed on a smaller number of adult male caribou. GPS tracked collars are considerably more accurate than satellite-tracked and provide three locations per day.

Digital maps are created using GIS software. Data are received from CLS America on a four-day interval, except during summer when data are collected daily (pre-calving, calving, and post-calving periods).

Maps of movements of Bluenose-East caribou are prepared by the Sahtu GIS Project (ENR, Norman Wells) and distributed to a limited group of recipients within ENR, the Sahtu Renewable Resources Board (SRRB), Wek'èezhìi Renewable Resources Board, and the Government of Nunavut.

Data have been used to map the annual and seasonal ranges of the Bluenose-West and Bluenose-East caribou herds within the SSA.

RESULTS AND DELIVERABLES

As of April 2011, there are 26 active collars on the Bluenose-East herd, of which 20 are GPS-tracked and 6 satellite-tracked.

Annual presentations on barren-ground caribou in Sahtu have been given to the (SRRB) and the Renewable Resource Councils (RRCs) during their regular meetings. Presentations have also been provided to Grades 9-12 students in all five Sahtu schools in multiple years.

Data were used in the ecological assessment of the Edaiila (Caribou Point) proposed protected area under the NWT Protected Areas Strategy.

Location data have been used to provide comments and recommendations as part of the response to industrial exploration and development land-use permit applications.

Collar location data are processed and stored in the database of the Sahtu GIS Project (ENR, Norman Wells). Location data are also stored in Government of the Northwest Territories (GNWT) Wildlife Management Information System (WMIS) data storage in Yellowknife. Data will be available to ENR staff and others (upon request & approval) for further analyses.

Long-term Plans and Recommendations

Additional collars will be deployed on adult female and adult male caribou from the Bluenose-East herd in March 2012 in preparation for planned 2012 population estimate survey.

PARTNERS

Sahtu Renewable Resources Board
Wek'èezhìi Renewable Resources Board
Environment and Natural Resources – Dehcho Region, Headquarters, Sahtu Region, North Slave
Government of Nunavut
Kitikmeot Hunters and Trappers Association

Funding

Sahtu Renewable Resources Board
Environment and Natural Resources – Sahtu Region
Western NWT Biophysical Study

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Ecology of Boreal Woodland Caribou in the Central Mackenzie River Valley

PERIOD: 2010-2011

Main Investigator: Heather Sayine-Crawford, Cumulative Effects Biologist, Environment and Natural Resources, Sahtu Region

RATIONALE

To collect baseline data on boreal woodland caribou in the NWT, which are listed as *Threatened* in Canada under the federal *Species at Risk Act* (SARA). Data will help assess any impacts of human activities and cumulative effects on boreal caribou and their habitats. The study provides a baseline that may contribute to further exploration of the impacts of climate change on boreal caribou populations.

OBJECTIVES

To identify, map, and verify boreal woodland caribou habitats by season, with particular focus on groups along, or adjacent to, the proposed Mackenzie Valley pipeline and other areas of potential development in the Sahtu region.

To collect baseline population data through a combination of GPS and satellite-tracked radio collars.

To provide information to evaluate the current and potential implications of further habitat loss and fragmentation, and cumulative effects of human activities and natural factors on boreal woodland caribou in the Mackenzie Valley.

METHODS AND INFORMATION COLLECTED

Since 2003, adult female boreal woodland caribou have been captured, collared, and radio tracked by GPS and satellite-tracked radio collars.

Digital maps were created using GIS software.

Habitat use models (resource selection function models) have been developed as part of a larger study of boreal caribou across their range in the NWT.

Aerial surveys have collected data on calving and recruitment.

Blood and fecal samples have been obtained for genetics and parasite analyses.

RESULTS AND DELIVERABLES

As of April 2011, there were 11 operational collars in the Sahtu Region; however, only three of those are currently still active.

In December 2010, we participated in a Sahtu Renewable Resources Board (SRRB) / Canadian Wildlife Service (CWS) study of traditional knowledge about boreal woodland caribou in the Sahtu Settlement Area (SSA) with representatives from the five Sahtu Renewable Resource Councils (RRCs). This study supplemented traditional knowledge (TK) collected on boreal woodland caribou in the Sahtu, Gwich'in, and Inuvik regions in 2000-2001.

Presentations on the study have been given to participants in an environmental monitor training program (Tulita) and to the SRRB and RRCs during their regular meetings.

Data were used in the ecological assessment of the Ts'ude Niline Tu'eyeta Candidate Protected Area under the NWT Protected Areas Strategy.

Location data have been used to provide comments and recommendations as part of the response to industrial exploration and development land-use permit applications.

Collar location data are processed and stored in the database of the Sahtu GIS Project (Environment and Natural Resources (ENR), Norman Wells). Location data are also stored in Government of the Northwest Territories (GNWT) Wildlife Management Information System (WMIS) data storage in Yellowknife. Data will be available to ENR staff (and others upon request and approval) for further analyses

LONG-TERM PLANS AND RECOMMENDATIONS

While no new collars are to be deployed on boreal caribou in the Sahtu region in the near future, the study will continue through 2011-12 while active collars provide data.

Radio collar studies and aerial surveys for boreal caribou in the Sahtu region should be resumed if the proposed Mackenzie Gas Project or other significant development activities (e.g., Mackenzie Valley Highway extension) are permitted to proceed.

Oil and gas exploration activity in the Tulita District is expected to greatly increase starting as early as winter 2011-12 as five companies bid $534 million for 11 oil & gas parcels put up for bid by the federal government. Under the terms of licences that may be issued for these bids – companies have up to five years to drill at least one well on their parcel. Exploration work is also expected to include seismic activity and will likely include three - dimensional as well as two - dimensional. Focused studies will be required to monitor and mitigate the impacts of such activity on boreal woodland caribou.

PARTNERS

Renewable Resource Councils – Fort Good Hope, Tulita, Norman Wells
Sahtu Renewable Resources Board
Environment and Natural Resources - Dehcho Region, Headquarters, Inuvik Region, Sahtu Region, South Slave
Faculty of Veterinary Medicine, University of Calgary

Funding

Environment and Natural Resources - Sahtu Region
Western NWT Biophysical Study

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Boreal Woodland Caribou Habitat and Productivity

Period: April 2010-March 2011

Main Investigator: Marsha Branigan, Manager Wildlife Management, Environment and Natural Resources, Inuvik Region

LOCATION:

Gwich'in Settlement Area

RATIONALE:

Boreal woodland caribou are listed as *Threatened* under the federal *Species at Risk Act* (SARA). A National Recovery Strategy is being developed and an NWT Conservation and Action Plan has been completed.

Until recently, little scientific knowledge was available for boreal ecotype woodland caribou (*Rangifer tarandus caribou*) that occur along the Mackenzie River Valley from the NWT/Alberta border to the area of the Mackenzie Delta. The SARA process requires sound baseline scientific and traditional knowledge.

OBJECTIVES:

To obtain estimates of home range size and seasonal movements of adult females and adult males;

To determine patterns of habitat use and selection including use of areas burned by wildfires and use of area in relationship to man-made linear features such as seismic lines;

To map the relative probability of occurrence of boreal woodland caribou across the Gwich'in Settlement Area using caribou use (satellite tracking) data and existing Landsat TM based vegetation maps;

To identify seasonal habitats that may be limiting for boreal woodland caribou in the Gwich'in Settlement Area;

To obtain estimates of productivity, recruitment and survival (calf and adult female) rates; and

To provide baseline information on caribou ecology prior to the construction phase of the proposed Mackenzie Gas Pipeline and possibly during the construction phase and provide the opportunity to compare with animals collared after the pipeline construction phase.

METHODS AND INFORMATION COLLECTED:

Telemetry flights were conducted in April to locate collared cow caribou. Composition of the group and whether the collared cow has a calf at side are recorded. The number of collars was too low so no flights were conducted in June and October.

GPS and satellite collars were monitored remotely throughout the year.

RESULTS AND DELIVERABLES:

No new collars were deployed in 2010. Calving rate in June 2010 was 79%. Late winter survival (June to April 2010), nine collars were located. Three of these animals had no calves in June. Overwinter survival was 71%.

Three collars went stationary between June 2010 and April 2010, two mortalities and one collar released.

LONG-TERM PLANS AND RECOMMENDATIONS:

Collared caribou will continue to be monitored until the last collars release in August 2011.

There are no plans to collar additional boreal woodland caribou in the region at this time as baseline data collection is complete.

PARTNERS:

Environment and Natural Resources
Gwich'in Renewable Resources Board (GRRB)

COMMUNITY INVOLVEMENT:

Assistants are hired from local communities of Inuvik and Tsiigehtchic. Results presented to GRRB and Renewable Resource Councils (RRCs).

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Boreal Caribou Fitness and Habitat Use in the Cameron Hills/ Hay River Lowlands Area of the Dehcho, Northwest Territories

Period: April 1, 2010 – March 31, 2011

Main Investigator: Allicia Kelly, Regional Biologist, Environment and Natural Resources, South Slave Region

LOCATION:

The combined study area is bounded by Hay River to the east, the Mackenzie River and Great Slave Lake to the north, the Redknife and Kakisa Rivers to the west and the Hay River to the south.

RATIONALE:

Boreal caribou are listed as a *Threatened* species under the federal *Species at Risk Act* (SARA). The cumulative effects of habitat destruction, hunting, disturbance by humans (including roads, seismic lines, and pipelines) and predation (by wolves and black bears) are implicated in the decline of boreal caribou. The results from this study will assist in assessing the status of this nationally threatened species in the NWT under the new *Species at Risk (NWT) Act*. A proactive approach to monitoring is needed to ensure boreal caribou do not become a species at risk in the NWT and to ensure boreal caribou continue to be sustainable in the NWT. This approach is necessary because the range of these caribou in the NWT and Alberta is where there is timber harvesting and oil and gas exploration and development.

OBJECTIVES:

To monitor population demographics: adult female survival, calf production, ten-month calf recruitment, and population rate of increase;

To document seasonal range use, annual home ranges and fidelity to calving areas of adult cows;

To examine boreal caribou habitat use and selection in relation to natural and human caused landscape features; and

To monitor presence of disease and parasites (establish baseline database).

METHODS:

Between March 2003 and February 2008, 60 boreal caribou cows have been collared in the Hay River Lowlands area. Fifty-one boreal caribou cows were collared in the Cameron Hills area.

Calf production is determined by assessing pregnancy rates from blood serum collected during the capture of cows during collaring, and by assessing movement rates of GPS-collared cows during the calving period (low movement rates is indicative of calving) or visual surveys for VHF collared cows.

Cow survival is monitored with GPS collars and by visually locating VHF-collared cows during fixed-wing radio-tracking in the fall and late winter.

Calf recruitment was determined from aerial surveys in March by counting the number of calves and adults in each range associated with collared caribou. Other caribou found with the collared cow were classified as adult female, mature male and calf. Recruitment is expressed as ratio of calves per 100 adult cows.

RESULTS AND DELIVERABLES:

Presentations of findings have been delivered to communities, including at the 2008 Dehcho regional wildlife workshop, the 2009 South Slave regional wildlife workshop and community meetings.

Annual progress reports (April 1 to March 31) have been produced.

Analysis of collar and survey data is ongoing and information from this study has been included in draft papers that will be submitted to scientific journals.

LONG-TERM PLANS AND RECOMMENDATIONS:

Most of the remaining active collars in these study areas are scheduled to release in 2011. The remaining collars will be insufficient to calculate demographic parameters (adult female survival; lambda).

This study was initiated to collect data on boreal caribou which were previously considered data deficient in the NWT. In 2011 - 2012, a new boreal caribou program will be developed based on monitoring requirements and information gaps.

PARTNERS:

Environment and Natural Resources

COMMUNITY INVOLVEMENT:

Community knowledge of boreal caribou habitat use was used to locate boreal caribou for the initial deployment of the radio collars. Community members have participated as observers in some field surveys. Study results have been presented and discussed at community meetings and regional wildlife workshops. Local First Nations review the application for a wildlife research permit each year.

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Seasonal Range Use and Movement Patterns of Boreal Caribou in the Dehcho

Period: 2010 – 2011

Main Investigator: Nic Larter, Regional Biologist, Environment and Natural Resources, Dehcho Region

LOCATION:

The study area includes both the south central and north central portions of the Dehcho, roughly bounded to the north by Blackwater Lake, to the south by the 60th parallel, to the east by the Redknife Hills (south) and the Horn Plateau (north), and to the west by the Liard Highway 7 (south) and the Mackenzie River (north). Caribou collared in this area do not respect these arbitrary borders.

RATIONALE:

Boreal caribou are listed as *Threatened* in Canada under the federal *Species at Risk Act* (SARA). The cumulative effects of natural and man-made disturbance have been implicated in the declining numbers of this species. Similar studies were initiated during 2002 - 2004 throughout the range of boreal caribou in the NWT, including the Inuvik, Sahtu, South Slave and Dehcho regions.

In partnership with Sambaa K'e Dene Band, Environment and Natural Resources (ENR) initiated this study in March 2004 by deploying radio collars on caribou in the Sambaa K'e traditional lands. The main study goals were to assess the basic ecology of boreal caribou and collect baseline data on caribou inhabiting areas subjected to limited human disturbance. In partnership with Łíídlı̨ Kų́ę́ First Nation and the Fort Simpson Métis, ENR extended the study in March 2005 when radio collars were deployed on caribou in the Ebbutt Hills area.

Preliminary DNA analyses indicate that the historical gene flow of boreal caribou in the NWT occurred in both a north - south and east - west direction. Boreal caribou residing in the central Dehcho provided an opportunity to collect key genetic data on historical gene flow corridors of boreal caribou, and to collect important ecological baseline data in an area of their range that already has one pipeline traversing it and falls within the proposed route of the Mackenzie Gas Pipeline.

With the success of the initial deployments of collars in 2004 and 2005, there was interest by other Dehcho First Nations in having collars deployed in their traditional lands. Following community consultations deployments in 2006, 2007 and 2008 included caribou residing in the traditional lands of Jean Marie River First Nation, Pehdzeh Ki First Nation, Nahanni Butte Dene Band, Acho Dene Koe Band and Ka'a'gee Tu First Nation.

OBJECTIVES:

To ensure enough collars are deployed on female caribou to document seasonal range use of female caribou over multiple years in areas of the boreal caribou range which has had limited fire and seismic disturbance, and areas with a greater linear footprint;

To ensure enough collars are deployed on female caribou to document seasonal movements of female caribou over multiple years, thus permitting us to assess the fidelity in seasonal movements and range use over a maximum four-year period;

To ensure enough collars are deployed on female caribou to document calving events, annual calving periods and fidelity to calving areas;

To collect detailed daily movements of individual females residing throughout the study area over a minimum three-year period;

To provide the baseline information on caribou ecology prior to and during the construction phase of the proposed Mackenzie Gas Pipeline, and provide an opportunity to compare with animals collared after pipeline construction;

To provide baseline information on caribou ecology in the Arrowhead area prior to additional industrial exploration and activity;

To provide annual estimates of calf production, late-winter female: calf ratios, adult female survival and population rate of increase;

To provide additional ecological data on boreal caribou as part of the requirements for procuring Protected Area Status for lands of interest in the Trout Lake, Wrigley, Jean Marie River and Kakisa areas; and

To ensure an adequate sample size of functioning collars on caribou for future population monitoring.

METHODS AND INFORMATION COLLECTED:

We did not deploy collars on female caribou this year; daily satellite location data were received, entered into a database and analyzed as required.

Collars that released from live animals were retrieved and collars were retrieved from animals that had died. All collars were refurbished for redeployment.

Limited aerial relocation flights were conducted to locate one caribou wearing a VHF collar and to verify transmissions and collar releases.

Calving events were determined for all but one collared female based upon analysis of their daily movements.

A March survey was conducted to document the number of collared females still with calves of the year and to classify sex / age groups of caribou observed.

RESULTS AND DELIVERABLES:

Posters showing caribou ranges over a three month period are produced quarterly and distributed to First Nation partners on an ongoing basis.

Community meetings and consultation are conducted annually on an ongoing basis.

Survey results have been circulated to all First Nation partners.

The lab analyses of biological samples are ongoing; a paper on the presence of diseases and parasites in boreal caribou was published in the *Journal of Wildlife Diseases* 46: 1096-1107 "Serum biochemistry, serology, and parasitology of boreal caribou (*Rangifer tarandus caribou*) in the Northwest Territories, Canada" (Johnson et al. 2010).

The *Dehcho Boreal Caribou Progress Report* (April 2011) is being circulated to all partners and will be posted on the ENR website.

A complete review of all results of the program was presented, discussed and well received at the biannual Dehcho regional wildlife workshop in October 2010 and are part of the final report posted on the ENR website.

Poster presentations were made at the 13th North American Caribou Workshop.

Location data from this study was incorporated into a territorial-wide analysis of boreal caribou resulting in a PhD thesis "Use of Space by Caribou in Northern Canada" by J.A. Nagy (2011). Additional scientific publications from this analysis are being prepared.

LONG-TERM PLANS AND RECOMMENDATIONS:

Monitoring of collars should remain ongoing with flights to retrieve collars being made as required. Retrieved satellite and GPS collars should be refurbished for redeployment.

All satellite collars retrieved will be programmed so they can determine calving events, thus eliminating the need for June surveys of calf production.

We encourage harvesters to return any collar from a harvested animal.

Keeping as many GPS collars active as possible in the study is preferable, hence when additional collars need to be purchased they should be GPS collars.

Caribou collared with GPS and the newly programmed ST-20 collars need not be surveyed post calving because analysis of their daily movement patterns can determine if and when they calved. Aerial calving surveys have been discontinued.

Meetings to discuss the caribou program with our partners will be ongoing.

At the Dehcho regional wildlife workshop (October 2010), the program was reviewed and critiqued by representatives from all Dehcho First Nations; recommendations included continuing the program and to ensure there were enough collared females to monitor the population. This would require deploying collars in February 2012.

Information from this study has been and will continue to be provided to the Dehcho Boreal Caribou Working Group as an essential part of the working group's mandate.

PARTNERS

Environment and Natural Resources
Sambaa K'e Dene Band
Nahanni Butte Dene Band
Jean Marie River First Nation
Fort Simpson Métis Local
Łíídlı̨ Kų́ę́First Nation
Pehdeh Ki First Nation
Acho Dene Koe Band
Ka'a'gee Tu First Nation

Photo: D. Allaire

COMMUNITY INVOLVEMENT:

At annual community meetings and biannual regional wildlife workshops, the caribou program is discussed in an open forum format. Community issues and concerns are addressed and collar deployment takes direction from these meetings. An annual application for wildlife research permitting provides additional avenues for community input. Local residents have participated in collar retrievals and in aerial reconnaissance flights when and if recommended by local First Nations. Because we all want to minimize animal harassment, collar deployment is contracted out to a professional team. Community members sit on the Dehcho Boreal Caribou Working Group. As part of its mandate the group not only solicits information from this study but also provides recommendations for this study.

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All Photos: D. Allaire

CLS America Data Acquisition (Caribou and Grizzly Bears)

Period: April 2010 to March 2011

Main Investigator: Marsha Branigan, Manager Wildlife Management, Environment and Natural Resources, Inuvik Region

LOCATION:

Gwich'in Settlement Area and Inuvialuit Settlement Region.

RATIONALE:

This study was established to help ensure that baseline data necessary to assess, mitigate and monitor the environmental impacts of proposed developments in the Western NWT is available to industry, regulators, communities and government.

OBJECTIVES:

To collect baseline data for boreal woodland caribou, barren-ground caribou and grizzly bear movements in the development area.

METHODS AND INFORMATION COLLECTED:

Collars were deployed on the species as set by the Environment and Natural Resources (ENR) NWT Wildlife Care Committee (WCC) applications. Collars were both GPS and satellite collars.

RESULTS AND DELIVERABLES:

Movements were monitored and archived in the Wildlife Management Information System (WMIS) from collared boreal woodland and barren-ground caribou, and grizzly bear.

LONG-TERM PLANS AND RECOMMENDATIONS:

Collared boreal woodland caribou will continue to be monitored until last planned collar release date of August 2011. There are no plans to collar additional boreal woodland caribou in the region at this time.

Redeployment of new collars is scheduled for March 2012.

GPS collars deployed on grizzly bears have all dropped off. Collection of baseline data is considered complete and data is being analyzed as part of thesis projects of several students and within ENR.

PARTNERS:

Environment and Natural Resources
Gwich'in Renewable Resources Board
Inuvialuit Game Council
Wildlife Management Advisory Council (NWT)

COMMUNITY INVOLVEMENT:

Assistants are hired from local communities of Inuvik and Tsiigehtchic. Results presented to Gwich'in Renewable Resources Board (GRRB), Renewable Resources Councils (RRCs), Wildlife Management Advisory Council (NWT), Inuvialuit Game Council and Hunters and Trappers Committees.

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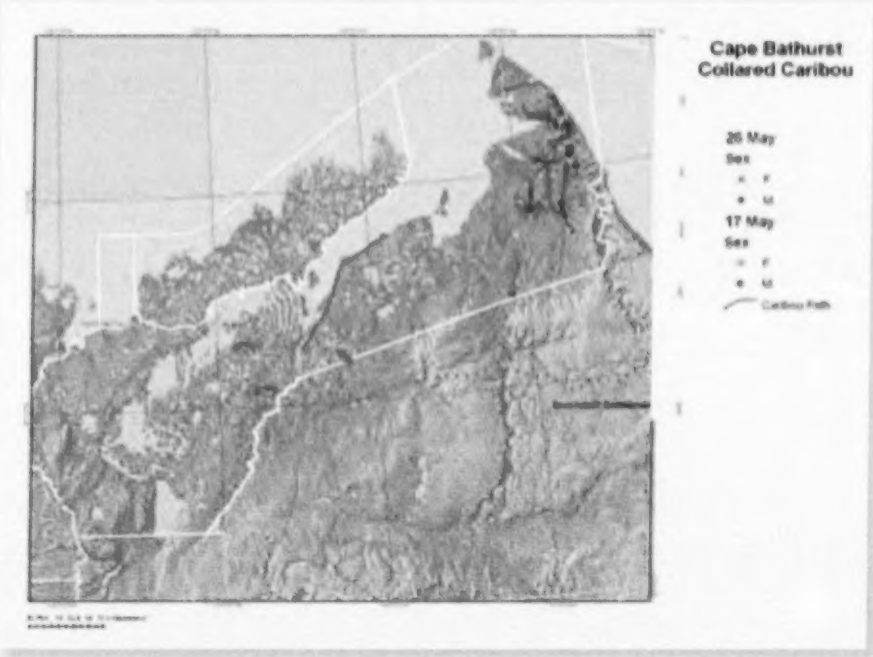

Dehcho Moose Population Monitoring Program

Period: 2010-2011

Main Investigator: Nic Larter, Regional Biologist, Environment and Natural Resources, Dehcho Region

LOCATION:

The aerial survey areas include the Liard River Valley and adjacent area and the Mackenzie River Valley and adjacent area south and west from Blackwater River to Jean Marie River. Biological samples come from traditional harvesting areas of members of local Dehcho First Nations.

RATIONALE:

Moose is an important traditional wildlife resource for residents of the Dehcho region of the NWT. Moose density estimates for areas within and adjacent to major harvesting corridors, and current and proposed industrial development, were lacking. Limited moose surveys were conducted in the Dehcho in the mid-1980s in relation to the new Liard Highway. One survey was conducted in the Liard Valley in 1994.

Moose in the Dehcho continue to be a highly sought after traditional food by both local residents and hunters residing in other regions of the NWT. Hunting pressure on moose has increased since the last surveys, especially with the restrictions recently placed on caribou harvesting. Local First Nations throughout the Dehcho region have voiced their concerns about the impact on moose numbers. These concerns, combined with increasing oil and gas activity in the Liard and Mackenzie River Valleys, indicated a need to assess moose populations prior to additional habitat loss and increased accessibility in the region. Being an important traditional food source, residents of the Dehcho also wanted to know what the health and condition was of the moose they harvested for food.

OBJECTIVES:

To establish baseline estimates of moose density in the Dehcho region and establish a community-based monitoring program of harvested moose.

To conduct annual small-scale aerial surveys for moose in areas of interest to five communities in the Dehcho region. Surveys would be conducted with the assistance of local harvesters as observers over a multi-year period.

To provide information that can be used to determine the timing of further large-scale moose surveys in the region.

To document health and condition indices of locally harvested moose throughout the region and increase community involvement in harvesting programs.

To document incidences of disease and parasites in locally harvested moose.

To document the levels of various heavy metals and other contaminants found in the organs of moose harvested as a country food source throughout the Dehcho region.

METHODS AND INFORMATION COLLECTED:

Traditional knowledge (TK) was used to stratify the air survey areas into high and low moose density areas.

The ver Hoef geospatial method was used for large-scale moose surveys flown in the Mackenzie River Valley (November 2003) and the Liard River Valley (February 2004).

Based on TK and these new sources of information, an annual moose monitoring program was initiated with five communities in the Dehcho region (Wrigley, Fort Simpson, Jean Marie River, Nahanni Butte, and Fort Liard).

The monitoring program consists of an aerial survey component (conducted in November) to assess moose distribution, density and calf production and a biological sampling program component to physically assess animal health and condition.

Biological sampling has allowed for the documentation of the incidence of parasites and disease and the documentation of levels of various contaminants in moose organs.

Sampling kits are available and sampling protocols have been discussed with harvesters in all five communities.

RESULTS AND DELIVERABLES:

Preliminary results, posters and summary reports have been provided to First Nations.

Preliminary results of some of the heavy metal work were presented at the 43rd North American Moose Conference and Workshop, the 15th Northern Contaminants Program Results Workshop, the 4th Biannual Dehcho Regional Wildlife Workshop, and at the 14th International Congress on Circumpolar Health.

Preliminary results were used in the decision for a public health advisory on the consumption of moose organs.

A presentation of the entire moose monitoring program was made at the 6th International Moose Symposium and was published in *ALCES* Vol. 45:88-99.

Photo: D. Allaire

A plain language poster on the level of cadmium found in moose meat and cigarettes was distributed before the 2010 fall hunt.

A paper from the 14th International Congress on Circumpolar Health was published in *Circumpolar Health Suppl.* 2010; 7: 351-355.

Scientific publications and government reports of additional results will be produced and presented in a variety of formats.

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LONG-TERM PLANS AND RECOMMENDATIONS:

Based upon results of the annual monitoring surveys and discussions with local First Nations, a large-scale moose survey should be conducted in 2011 / 2012.

After receiving unanticipated analyses of banked organ samples, we continue to work on a thorough statistical analysis of contaminant results from moose organs.

Basic biological sampling of harvested moose continues to be ongoing.

All biological samples collected will be stored frozen should additional analyses be required in future.

Although the collection of organ samples has ended for now, it may be reinstated in the future to address any temporal changes.

PARTNERS:

Environment and Natural Resources
Dehcho First Nations
Previous funding from Northern Contaminants Program

COMMUNITY INVOLVEMENT IN SAMPLE COLLECTION AND SURVEY OBSERVERS:

At annual community meetings and regional biannual wildlife workshops the current status of the moose program is presented and critiqued in an open forum setting. Community concerns are raised and addressed at such meetings and the program is modified accordingly.

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Photo: D. Allaire

Nahanni Wood Bison Population Survey

Period: 2010–2011

Main Investigator: Nic Larter, Regional Biologist, Environment and Natural Resources, Dehcho Region

LOCATION:

The survey area is located in the southwest of the Dehcho and covers an area that extends into southeastern Yukon Territory and Northeastern British Columbia.

RATIONALE:

The first and only survey to estimate population size of the Nahanni wood bison population was conducted in March 2004. At that time, it was acknowledged that future population surveys would be required every five to six years. A population monitoring program, involving annual sex / age classification surveys was established at that time and has been in place since then, meeting with annual approval for such research from First Nations in both Nahanni Butte and Fort Liard. Classification data are useful for evaluating the impact of selective hunting, herd productivity, causes of death, and predation on calves. These data also provide useful measures of the population status in the years between population surveys.

As part of discussions related to establishing a wood bison management strategy for the Northwest Territories, the need for another population survey was raised at both the community and departmental levels, especially since it was seven years since the previous population estimate. This is a shared population with its range extending into northeastern British Columbia and the southeastern Yukon Territory. Updated population information that verifies that the population is at least 400 animals is important for contributing to the national recovery of wood bison.

The deployment of radio collars to provide a more accurate population estimate will also serve to provide additional range movement information as these collars will be programmed to provide one to three locations of bison daily for at least another two years.

OBJECTIVES:

To deploy collars on seven bison prior to the population survey to provide an index of sightability for the aerial survey;

To conduct an aerial survey to estimate the size of the Nahanni wood bison population;

To provide an updated population estimate for part of the National Recovery Strategy for wood bison and the *Northwest Territories Bison Management Strategy*;

To incorporate sightability information into the population estimate; and

To continue monitoring location data of collared bison to document movement patterns and range use, especially in regards to crossing the Liard River, using linear features primary as movement corridors, and expanding their range of occupancy.

METHODS AND INFORMATION COLLECTED:

We deployed collars on five female and one male bison in February 2011, and one female in March 2011.

Bison were immobilized by darting from a helicopter using a protocol approved by the NWT Wildlife Care Committee.

We flew an aerial strip transect survey March 15-17, 2011.

Local observers were hired from both Nahanni Butte and Fort Liard, NWT.

3,400 km of transect lines were flown, including commute.

All wildlife observed both on and off transect was recorded and a location determined by GPS.

A population estimate was derived using appropriate statistical analyses and the application of sightability index based upon observations of radio collared animals that were made or missed during the survey flight.

RESULTS AND DELIVERABLES:

A briefing note with preliminary results was circulated to First Nation partners on March 23, 2011.

Posters showing flight lines, wildlife observed, describing the wood bison survey and providing the population estimate were provided to First Nation partners in May.

Bison were more spread out over the entire survey area in 2011 compared to in 2004.

The bison population was estimated at 413 ± 213 (95% confidence interval), which is similar to the 2004 estimate of 403 ± 256.

Community presentations of the survey and results were made in Nahanni Butte and Fort Liard during May and July.

A final report of the survey will be drafted.

LONG-TERM PLANS AND RECOMMENDATIONS:

Continue annual monitoring of the population by conducting sex / age classification surveys.

All movement data from satellite collared animals will be analyzed and made available for use with national recovery planning, and for creating management plans as part of the NWT Bison Strategy. Location and classification survey data will be used to determine when the next population survey should be conducted and the area of occupancy that should be included in the survey.

PARTNERS

Environment and Natural Resources
Nahanni Butte Dene Band
Acho Dene Koe Band
Yukon Territorial Government
Government of British Columbia

COMMUNITY INVOLVEMENT:

As part of the Northwest Territories Bison Strategy and part of the Dehcho Nahanni Bison program, we held community meetings and biannual regional wildlife workshops where concerns about bison management are discussed in an open forum format. Direction on collar deployment was taken from these meetings as was the request for another population survey, and continued monitoring with annual sex / age classifications. Local residents, Tommy Betsaka, Jack Mouye, and Garrett Sassie, were hired as observers for the aerial population survey.

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Photo: B. Elkin

Photo: N. Larter

Photo: A. Veitch

Dehcho Bi-annual Regional Wildlife Workshop

Period: October 19, 2010 to October 20, 2010

Main Investigator: Nic Larter, Regional Biologist, Environment and Natural Resources, Dehcho Region

LOCATION:

Delegates from all Dehcho First Nations travelled to Fort Simpson where this two-day workshop was held.

RATIONALE:

Shortly after staffing the Environment and Natural Resources (ENR) biological program in spring 2002, Dehcho First Nations and the former Department of Resources, Wildlife & Economic Development (RWED) co-hosted a regional wildlife workshop to discuss local wildlife issues, introduce the newly hired biological staff, and get direction for pertinent regional wildlife research programs.

The workshop was such a success that one of the resulting action items was for RWED to ensure that similar workshops would be held every two years. The fall 2004 workshop was another well-attended success and again RWED was requested to continue hosting workshops every two years. ENR has since hosted regional wildlife workshops in October 2006, 2008 and 2010.

OBJECTIVES:

To facilitate the ongoing communication between wildlife researchers and Dehcho First Nations membership.

To provide an open forum for the discussion of wildlife issues of concern to Dehcho First Nations members.

To provide an open forum for wildlife researchers, from a variety of organizations, to present results of their work and receive feedback.

To provide an open forum for the discussion and direction of proposed wildlife research in the Dehcho.

METHODS AND INFORMATION COLLECTED:

ENR covers the expenses for up to two delegates from each Dehcho First Nation to attend the workshop.

The workshop is open to the public and there are often many First Nation members in addition to the delegates in attendance.

There are two days of presentations and discussions with coffee breaks and lunches on site being catered by local schools. This type of relaxed atmosphere facilitates viewing the many poster presentations and continued less formal discussions.

Day 1 – consists mostly of presentations of research programs (proposed and ongoing) by various government and non-government agencies. It always begins with a presentation on how ENR has responded to the action items tabled at the previous workshop.

Day 2 – consists mostly of open discussions revolving around First Nation concerns, comments, and critiques about wildlife issues and wildlife programs. It results in the consensus of a list of action items for ENR.

RESULTS AND DELIVERABLES:

After each workshop a final report is generated and circulated to all Dehcho First Nations and participating organizations. This report includes a summary of all discussion topics, a list of action items, a list of all in attendance, and copies of all of the presentations. Colour hard copies are provided to all First Nations and associated groups; digital copies are made available on a request basis. Copies of posters presented at the workshop are also available by request. Digital transcripts of the workshop are kept on file. In 2010, the final report was made available on the ENR website, www.enr.gov.nt.ca.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long term plans are to continue to hold regional wildlife workshops as a biennial event in the Dehcho and to continue encouraging the exceptional attendance by all Dehcho First Nation membership. This event has become so well known in the region that we had to turn down requests from some University researchers to make presentations. Workshops based upon this format are being conducted by ENR in other regions.

It was recommended that final reports of previous workshops also be made available on the ENR website. Final reports from the 2006 and 2008 workshop are now available on the website.

PARTNERS:

Environment and Natural Resources South Slave, Dehcho, Headquarters
Parks Canada
University of Alberta
Dehcho First Nations

COMMUNITY INVOLVEMENT:

This biennial workshop is a key forum for all Dehcho First Nations to comment and make recommendations to all Dehcho ENR wildlife programs. It is well attended by members of the community and action items generated from the workshop are implemented through the appropriate programs and critiqued as part of the agenda for the next meeting. Local schools participate as caterers for the event.

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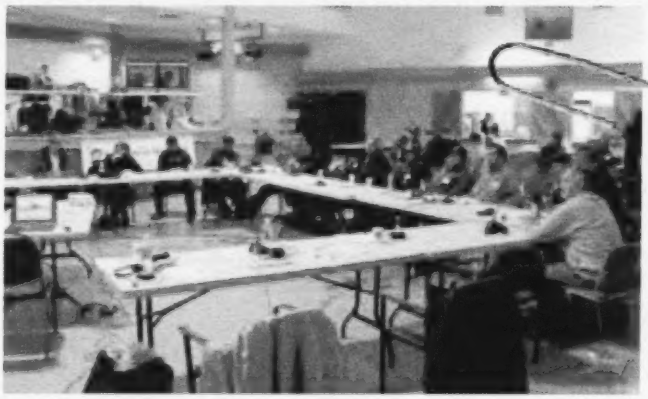

Photo: D. Allaire

Western NWT Biophysical Study

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